Achieving Sustainable Procurement Practices in the Nigerian Construction Industry: Examining Potential Barriers and Strategies

Luqman Oyekunle Oyewobi[1], Mohammed Ismail Ija[2] & Richard Ajayi Jimoh[3]

[1]Department of Quantity Surveying, Federal University of Technology, Minna.

[2]Department of Quantity Surveying, Niger State Polytechnic, Zungeru

[3]Department of Building, Federal University of Technology, Minna

Abstract

Procurement is a main procedure in realising construction project management. This study reviewed the existing procurement practices in the Nigerian construction industry with the aim of identifying barriers to sustainable procurement and develop strategies that will enhance procurement practices and ensure the construction industry perform sustainably. A sequential mixed methods research design was adopted in this study. The qualitative method was first employed to understand the current status of the procurement practices by using semi-structured interview and document analysis as tools. The study revealed that the most severe barrier to sustainability is lack of government commitment, and that the best strategy is to ensure that competent people are saddled with the responsibility for integrating and implementing sustainability issues. The study concluded that the current procurement practices in the Nigerian construction industry is yet to embrace the triple bottom line of sustainability initiatives as it places more emphasis on the economic aspect of procurement. Therefore, Nigerian Governments should join the global campaign through the review of current procurement Act to embrace sustainability. This will assist in addressing the barriers of sustainable development through procurement practices by leveraging their impact as major customers of good and services in the industry.

Keywords: *Barriers; Construction industry; Nigeria; Procurement and Sustainability*

Introduction

In the 1980s, the Nigerian construction industry contributed 7% to the Gross Domestic Products (GDP) (National Bureau of Statistics [NBS], 2008). This significant contribution confirms Walsh and Sawhney (2002) assertion that construction activity is a significant contributor to GDP in most industrialized countries; and to global economic growth in general. Contribution of the construction sector in developed countries like the United States of America (USA) and Australia was recorded to be around 10.7% (Walsh and Sawhney, 2002) and 6.3% (Crose, Green, Mills & Toner, 1999) in 1996, respectively. It is evident, therefore, that the industry plays significant role in national development of a nation.

However, by 2002, construction contribution to GDP in Nigeria was reduced to 1% of the GDP (Organisation for Economic Co-operation and Development AFO/OECD, 2004). About 50% of the material resources for construction are taken from nature, 40% of energy consumption and 50% of total waste generated (Othman, 2010); resulting in ozone layer depletion, global warming, landfills, deforestation avalanches, quakes, pollution, and waste. As a result of these global effects, sustainable public procurement is increasingly being recognized as an instrument of government policy and a lever for wider economic, social and environmental changes (OECD, 2007). However, according to Carter and Rogers (2008), sustainable procurement surpasses the traditional triple bottom line of economic, social and environment changes. In fact, Berry and McCarthy (2011) viewed sustainable procurement as a process by which organisations attain their needs for goods, services, works and utilities in a way that enable them realise value for money on a whole life basis with the purpose of generating real long term benefits, not only to the organisations, but also to the society and the economy, while minimising damage to the environment. It encompasses ethical procurement and e-procurement (Angeles & Ravi, 2007; Wild & Li, 2011) which are fast-growing areas of interest in both corporate and government organizations across the globe.

In Nigeria, there has been existing open abuses to criteria in the award and execution of public works. These are apparent in repeated delays, cost overruns and frequent building collapse (Aibinu & Odeyinka, 2006; Ogunsemi & Jagboro, 2006; Fagbenle & Oluwunmi, 2010). The surge in uncompleted and abandoned projects littering the environment in Nigeria not only

contradict sustainable development but also calls to mind, the procurement methods employed to deliver such projects. It is obvious that the public procurement systems lack sustainability ingredients, both in concept and strategies. This underscores the need to integrate sustainability issues into construction procurement and establish the importance of paying particular attention to the stage of developing a procurement strategy in order to attain sustainable development and, transit to achieving economic growth and developmental strides in this millennium.

In 2002, World Summit on Sustainable Development called for governments globally to promote public procurement policies that will enhance sustainable development by encouraging the diffusion of goods and services that will be environmentally sound (United Nations [UN], 2002). In fact, one of the many recommendations was that governments should find a way of integrating sustainability issues into their public procurement decision making process. After this call, many developed countries such as Australia, Japan and the United Kingdom have taken the front seats in advancing the need for sustainable practices in public procurement (Abd-Wahid, Sazalli & Ramli,

2014). Despite the fact that sustainable procurement can improve procurement practices and promote sustainability performance of the construction industry in general (Ruparathna & Hewage, 2015a), coupled with the global policies, reports and researches addressing the subject matter, the Nigeria construction industry still lacks social, economic and environmental sustainability criteria. According to European International Contractors (EIC) (2004), to achieve sustainable development, 'sustainable procurement' is imperative in both concept and practice.

Consequently, governments the world over have recognized the necessity for a sustainable built environment since the construction industry has been known to use large amount of materials, energy, and generating huge volumes of waste (Ibrahim, Krawczyk & Schipporiet, 2004). Obviously, the way forward is to embrace sustainability in the construction industry. However, this is not the case in developing countries like Nigeria where the clamour for sustainability has just begun. To this end, this study will make contributions to the growing body of literature in sustainable practices.

The review will provide an insight into the current procurement practices in the

Nigerian construction industry and examine whether efforts have been made regarding the global callings on the integration of sustainable practices into country's procurement system. It will also examine the potential barriers to effective implementation of sustainable procurement in the Nigerian construction industry. In addition, this study explores the opportunity to present strategies that will help explain how sustainable practice policies and interventions necessary to further develop sustainable practices could be enhanced.

Literature Review

Nigerian procurement practices

Uyarra and Flanagan (2010) defined public procurement as "the acquisition of goods and services by government or public sector organizations". Procurement is part of wider activities of government (Thai, 2001) and is designed to bring about transparency and innovations in transmuting the manner in which services are organised, rendered and delivered to improve the life of buyers and enhance user's experience. International Institute of Sustainable Development (IISD) (2008) reported that on the average, between 45 to 65% of a country's budget and 13% to 17% of their GDPs are procurement related, this alluded to the fact that public sectors are the largest consumers in an economy.

In Nigeria, between 1999 and 2000, there was a Country Procurement Assessment Report (CPAR) which indicated that prior to 1999, Nigeria lost $10 billion on a yearly basis to corruption via award of contracts (CPAR, 2000). As a result of this, Nigerian government identified the need to have a comprehensive public procurement policies and practices as essential recipes for good governance. Therefore, good practices are deemed to be capable of reducing costs and generating appropriate results; while poor practices often lead to waste and delays and are majorly the source of allegations for corrupt practices and government inefficiency.

It is on this premise that the "Due Process Policy" was introduced into the nation's procurement system in 2002 (Fayomi, 2013). The document was passed into an Act by the parliaments which is now called "Public Procurement Act" 2007 to become a full legislation designed to eliminate the shortcomings and government inefficiencies and weaknesses that characterised public procurement of the past. Before 2007, Nigeria was among the few Sub-Saharan African countries without documented legislation on Public Procurement.

The Nigerian government identified the need for public procurement system that will urgently eliminate or reduce the global perception index and inefficiencies that have potentials to impact on good governance, and to build trust through the procurement system. Some of the defects noticed that necessitated the legislation according to the Budget Monitoring and Price Intelligence Unit (BMPIU) manual (2005) include:

I. Lack of competition and transparency in project procurement leading to high cost of project.

ii. Budget proposal submitted by the Ministries, Departments and Agencies (MDAs) not being related to justifiable needs.

iii. Improper project packaging and definition, compounding ineffectiveness.

iv. Projects not prioritized, recorded and synchronized among the MDAs such that many MDAs are pursuing the same or similar needs simultaneously with resultant lack of economic efficiency and effectiveness while creating overlap and waste.

v. Preference for new projects thereby encouraging regular midstream abandonment of projects in progress

thus fuelling the cultural disdain for maintenance, rehabilitation and refurbishment of existing facilities and infrastructure.

However, the Bureau of Public Procurement is saddled with the responsibility to ensure full conformity of all stakeholders with the laid down guidelines and procedures for the procurement of works, goods and services with the five basic concerns that govern procurement policies:

I. To ensure that goods and services needed are procured with due attention to economy and efficiency;

ii To ensure that public fund is used to buy only those goods and services needed for national development;

iii To give all qualified bidders an equal opportunity to compete for contracts;

iv. To encourage development of local contractors and manufacturers; and

v. To ensure that the procurement process is transparent

However, a review of the current Nigerian Public Procurement Act 2007 shows no emphasis on sustainability. Whereas, an efficient public procurement system should ensure value for money in government expenditure, which is essential to a country facing enormous development challenges.

In spite of the significance of public procurement to the economic growth of the nation, many of the previous studies conducted in Nigeria (e.g. Ogunsanmi, Iyagba & Omirin, 2003; Ojo, Adeyemi & Fagbenle, 2006; and Dada, 2011) have been on the investigation of how a single or a few specific procurement alternatives influence one or two project objectives. Little or no empirical research exists in Nigeria that specifically addresses the triple bottom line of sustainable procurement practices within public and private sector of the industry. This informed the critical look this research, at how sustainability initiatives could be integrated into the current Nigeria procurement practices to achieve value for money on a whole-life-basis of the project. This in terms of creating benefits not only to the public sector, but also to the society and the economy, while minimising damage to the environment (Department for Environment, Food and Rural Affairs [DEFRA], 2006).

Sustainable public procurement
According to Brammer and Walker (2011), sustainable procurement is the act of incorporating a concern for comprehensive social and environmental influences within government or public sector procurement process. However, sustainable development is dependent upon sustainable procurement that maintains balance between social, economic and environmental needs of the society. Although, many procurement officers mainly focus their procurement strategies on three elements: price, quality and time without consideration for the fourth dimension, sustainability. Whereas, in practice, the sustainability impacts of a potential supplier's approach are evaluated based on quality consideration, which is often sub-divided into social, economic and environmental (Omwoha, 2015). Sustainable procurement is not only about responsible purchasing or being 'green'. It is about good business practices that focus on delivering procurement of goods and services socially and economically with sound solutions to a business while minimising the environmental impact throughout a supply chain (DEFRA, 2006).

Construction activities have significant impact on the environment and in spite of the acknowledgement that issues of the environments are germane to optimal performance of the construction industry, activities of the industry have resulted into waste generation, exploitation of resources, continuous and unabated degradation of the

environment (Du Plessis, 2002). In spite of the increasing number of research on how procurement process could improve the performance of the construction industry, there is paucity of study in Africa more specifically in the Nigerian context that addresses the challenges of integrating the triple bottom line of sustainable procurement practices within the public sector. Previous researches and literature that examined sustainable practices are mostly from the perspectives of the developed countries. For example, UK (Hall & Purchase, 2006); Canada (Ruparathna & Hewage, 2015b); the USA (Coggburn, 2004) and internationally or across countries or regions (Brammer & Walker, 2011), and few others from the Asia such as Malaysia (McMurray, Islam, Siwar & Fien, 2014).

It is of note that the policies on sustainable procurement varied across the globe because of local underlying forces (Perera, Chowdhury & Goswami, 2007), hence, it is essential to develop sustainable procurement guidelines that will reflect the local dynamics (Ruparathna & Hewage, 2015a). This is supported by Rwelamila *et al.* (2000) who contended that failure to consider local forces in the development of systems within the developing countries

construction industries is a potential recipe for setbacks. Presently, there are no clear guidelines, procedures or mechanisms in place in Nigeria to integrate the sustainable initiatives in the procurement process despite being a member of the United Nations movement for Sustainable Development. And, adequate knowledge of sustainability concept and how it could be integrated or linked to the procurement process is yet to be comprehended within the context of Nigeria as a developing nation. Therefore, sensitisation and information remain the major issue for the development of sustainable procurement practices.

Research Methodology

In order to realise the aim of the study;, mixed methods methodology combining both qualitative and quantitative sequentially was employed that is domiciled in pragmatic paradigm. According to Bryman (2006), pragmatism is a method of justifying the collective use of both qualitative and quantitative approaches in a single research.

In line with this, Dainty (2008) and Oyewobi (2014) contended that plurality of research approach within the construction management research will assist in providing solutions to the challenges facing

the construction industry as the approach is capable of drawing from the inherent advantages of the two methods in improving the quality of the results. This approach is consistent with the methodology used by Ruparathna (2013) and McMurray *et al.* (2014) in examining sustainable procurement barriers and opportunities in the Canadian construction industry and Malaysian organisations respectively. Following Creswell and Plano-Clark's (2011) procedure, sequential exploratory strategy was employed for this study.

This entailed documentary analysis of documents such as tender notice, tender documents, pre-qualification requirements, contract documents and 2007 procurement Act. This was followed by semi-structured interviews that were conducted to obtain as much information as possible on the perceptions of the industry, and to capture a sense of what industry practices are perceived to be from construction practitioners with respect to sustainable procurement. Data obtained from this phase was used to develop the questionnaire survey for the second phase in order to have a better understanding of the study. These formed the basis for the conclusion reached and the recommendations proffered.

Qualitative Phase

The qualitative approach according to Liu and Fellows (2003) provides researcher a deeper understanding of problems to recognise the basic causes, principles, and behaviours of respondents on issues being investigated. According to Walker (1997), qualitative approaches are explanatory in nature with the major aim of attempting to uncover solutions to 'how?' and 'why?' questions by trying to develop themes from the information so obtained (Creswell, 2003).

Prior to the semi-structured interviews, documents relating to procurement issues which included tender notice, tender documents, pre-qualification requirements, contract documents and 2007 procurement Act were obtained from anonymous sources and also from the Bureau of Public Procurement websites as well as Budget Monitoring and Price Intelligence Unit (BMPIU) manual (2005). These documents were reviewed to identify whether they took into consideration the triple bottom line of sustainability in the procurement process. All the documents did not place emphasis on sustainable procurement issues which informed the decision to probe further using interview to have a critical look at the current Nigeria construction procurement

practices; and explore the level of awareness, identify the barriers and find ways sustainability can be integrated into present procurement initiatives.

Interviews

The sequential research design adopted in the study allowed the qualitative phase to come before quantitative, in order to examine the level of awareness of the concept of sustainable procurement and to establish that the second phase of the research will be more comprehended by the target audience for the research. This phase was realised through in-depth semi-structured interviews which provided the required opportunity for the researchers to have an in-depth exploration of subject (Trochim and Donnelly, 2008). To ensure that the obtained data for the phase will provide the required reliability and validity, experts in the construction industry were interviewed (see Table 1) (Lim, Oo and Ling, 2010).

A purposive sampling technique was used to select the procurement experts; ten semi-structured interviews were conducted with procurement experts and practitioners within the construction industry in the Federal Capital Territory, Abuja. This sampling technique is a non-probability

sampling procedure which is usually used in research that has to do with selecting respondents based on their knowledge, appropriateness and typicality of the sample selected (David & Sutton, 2004; Cohen *et al*, 2005). Emails were sent randomly to 20 potential interviewees from the list obtained to solicit for their attention for interviews. Initially, only five respondents agreed to be interviewed and they included one person from the academia and 4 from the construction industry (two project managers, one quantity surveyor and one builder).

After several calls, a total of 10 interviewees were obtained (see Table 1) and a letter seeking their consent as well as the interview guide were made available to them ahead of the interviews. The interview guide consisted of 10 open ended questions that permitted the interviewer to probe further. Permission of the interviewees were sought to tape record the interview sessions; all of the respondents agreed to this and each interview lasted for about 25 to 30 minutes.

The interviews were transcribed, sorted, coded and analysed using the deductive analysis method following these three steps and according to the research question and literature review. The deductive method of analysis comprises constant comparison

between the interview results in order to determine common themes in the interviewees' responses. The themes that emanated from the analysis were implementation of sustainability issues; barriers to the adoption of sustainable practices; sustainable criteria; method of evaluation of bidding; strategies for integrating triple bottom line laid the foundation for the questionnaire survey in the quantitative phase.

However, the results of the questionnaire survey on the barriers and strategies for implementing sustainability in the Nigerian construction industry is presented here. A list of the persons interviewed, in addition to the interview guide, are as shown in Table 1.

Table 1: List of interviewees and their positions

Respondent's Designation	Number
Quantity Surveyors	2
Academics	1
Procurement managers	3
Procurement officers	2
Project managers	2

The quantitative phase

The quantitative approach was used to provide a general understanding of the research problem (Creswell and Plano-

Clark, 2011). This approach was considered essential because it offered strong stream of evidence for empirical research in explaining phenomenon, and because it assisted the researcher in addressing the questions of '*how much'* or '*how many*?' as suggested by Walker (1997). Fellows and Liu (2008) suggested three main approaches that can be used in carrying out a quantitative study, these include desk research, experimentation and surveys.

Survey approach was adopted to obtain quantitative data using a cross-sectional means, and the item instrument was identified through extensive review of literature. The survey was carried out during the meeting of Procurement Officers in the Ministries, Departments and Agencies (MDA's) of the Federal Government of Nigeria at the Bureau of Public Enterprise (BPE), Abuja.

Though a purposive sampling method was adopted, it would have been difficult to have a large concentration of these professionals in one place and the high response rate obtained. One hundred and sixteen (116) well-structured questionnaires were self-administered to professionals that included Quantity Surveyors, Architects, Supply Chain Managers, Builders and Engineers.

Out of these questionnaires, 100 (86.21% response rate) were returned as analysed below.

Results and Discussion

The items used in measuring the potential barriers were also first examined for its appropriateness for factor analysis. This was done to ensure that the basic assumptions of linear relationships and normality between variables to be correlated and the pairs of variables at a moderate level were not violated. The PCA approach using varimax rotation was employed to extract possible components, all items with lower communalities were eliminated to improve variance to be explained in the factors. Kaiser's criterion using Eigenvalue greater than or equal to one was used in retaining the likely factors to be retained. The KMO was 0.733 which was above the required threshold of 0.5 as suggested by Field (2013) and Hair *et al*. (2010). Table 2 shows that four factors that have initial Eigen values greater than 1 were retained from the items employed to measure the barriers. From the Table 2, the first component explains approximately 27% while components 2, 3 and 4 explain 18.67%, 17.20% and 10.64% respectively. Together, all the components explain 73.39% of the total variation shown by the rotated results.

The first factor (Attitude and poor fiscal incentive**)** had seven items, the second (Financial constraints) had three items, the third factor (Poor leadership and awareness) had three while the last component (regulatory constraints) had two components loaded on it after it was rotated using varimax method. The rotation was executed many times to eliminate complex items and ensure that items were loaded onto only one factor (Field, 2013). This approach was used in a similar study carried out by McMurray *et al*. (2014) in establishing the opportunities and barriers of sustainable procurement practices by the Malaysian organisations. Based on the assessment of the intrinsic relationships among the variables considered and clustered under each factor as shown in Table 2, the study interpreted the results as follow:

Factor 1: The first factor extracted is renamed *attitude and poor fiscal incentive*. Six variables were clustered under this heading which includes: unwillingness to change, fewer developers undertake green building projects, lack of sufficient time to address sustainability issues, poor awareness and delay in decision making, economic conditions, lack of market segmentation, and risk associated with implementation of new practices. This

finding underscores the results of Darko and Chan (2016) who identified among others attitude and lack of government incentives as barriers to sustainable procurement. Also, Al-Sanad (2015) identified unwillingness to change and presence of fewer developers undertaking green projects as major barriers to sustainability.

Factor 2: The variables loaded on this factor are classified as *financial constraints*. These variables include lack of funding, poor separation between capital budget and operational budget for sustainability issues. This barrier has been stressed by researchers such as Sourani (2008) and Walker and Brammer (2009) where it was argued that financial constraints is the most ranked barrier to sustainability issues in the UK construction industry. Also, Ametepey *et al*. (2015) posited that one of the major barriers to sustainable practices is financier barrier. However, Preuss (2007) stated that financial constraints are reported in many of the previous studies as the principal barrier to adopting sustainable procurement practices, while Roos (2012) considered inflexible budgetary mechanisms as a clog in the wheel of achieving sustainability.

Factor 3: This is named *poor leadership and awareness* and three variables were

clustered under this factor. The result supports Roos (2012), who asserted that some strong barriers to sustainable procurement practices implementation were a lack of awareness and knowledge both at decision-makers and general public level. The assertion is not different from the conclusion drawn by McMurray *et al*. (2014) who examined sustainable procurement in Malaysian organizations and found that lack of awareness remained the most significant barrier to sustainable procurement implementation regardless of organizations or sectors. In line with these assertions is the findings by Sourani (2008) and Ametepey *et al*. (2015) who posited that lack of leadership is a barrier to sustainability.

Factor 4: The variables under this cluster are renamed as *regulatory constraints*. Lack of government commitment and resistant to change are two major variables considered here. Sourani (2008) identified insufficiency and inconsistency of policies, regulations and commitment by leadership as chief barriers to sustainable practices among other factors. This assertion is re-echoed by Darko and Chan (2016) who posited that lack of authority and efficiency in enforcing green building laws and regulations constitute barriers to sustainable

Table 2: Factor loadings for the Rotated Components Barriers to sustainable procurement (N = 116)

Coding	Variable Description	Mean Value	1	2	3	4	Communalities
			Component loading				
	Attitude and poor fiscal incentive						
B6	Unwillingness to change	3.74	.910				.854
B5	Fewer developers undertake green building projects	3.69	.765				.650
B40	Lack of sufficient time to address sustainability issues	3.68	.732				.765
B23	Poor awareness and delay in decision making.	3.64	.723				.549
B1	Economic conditions	4.16	.620				.690
B21	Lack of market segmentation,	3.21	.607				.687
B2	Risk associated with implementation of new practices	3.59	.602				.616
	Financial constraints						
B37	Lack of funding and restrictions on expenditure	3.59		.865			.756
B25	Lack of sustainability measurement tools,	3.69		.825			.709
B38	Separation between capital budget and operational budget	3.41		.782			.733
	Poor leadership and awareness						
B20	Lack of leadership,	3.42			.869		.789
B32	Lack of awareness of clients,	3.75			.836		.763
B35	Lack of education and knowledge in sustainable design.	3.95			.689		.778
	Regulatory constraints						
B41	Resistance to change	3.51				.758	.830
B18	Lack of government commitment,	4.42				-.680	.840
	Total		4.032	2.801	2.580	1.596	
	% of Variance		26.882	18.672	17.201	10.639	
	Cumulative %		26.882	45.554	62.755	73.394	

KMO= 0.733, Bartlett's Test of Sphericity (Approx. Chi-Square) =1242.873 , df = 105, p=0.000

Note: 1.00-1.49 - not very severe, 1.50-2.49 - not severe, 2.50-3.49 moderately severe, 3.50-4.49 severe, 4.50-5.00 Very severe

The 35 items were identified in literature as ways of addressing sustainability in developing a sustainable procurement strategy. These items were subjected to Principal Components analysis (PCA) using IBM SPSS version 21. Before carrying out the PCA, the research test for the appropriateness of data for factor analysis. This was carried out to ensure that the underlying assumptions of normality, linear relationships between variables to be correlated and the pairs of variables at a moderate level were not violated. While inspecting the correlation matrix generated by the PCA, matrix revealed the existence of several coefficients above 0.3.

The Kaiser-Meyer-Olkin value was estimated to be 0.88, which was higher that the recommended threshold value of 0.5 (Hair *et al.*, 2010; Field, 2013) and Bartlett's Test of Sphericity was statistically significant, which offered support to the factorability of the correlation matrix. This indicates that the variables were highly correlated to give a reasonable basis for factor analysis as shown in this analysis. The PCA indicated the presence of four components with eigenvalues greater than 1, which explains 26.19%, 20.50%, 13.76% and 10.07% of the variance respectively. The study examined the communalities

before the rotation to establish the association between the variable and all other variables (Yong and Pearce, 2013). However, some variables with low communalities were removed to improve the scale since factor analysis is aimed at explaining the variance through the common factors (Child, 2006; Pallant, 2010).

The four components were rotated using orthogonal (varimax) rotation, based on the eigenvalues criterion of over 1 and the scree plot. Four components were retained After rotation, the four-component extracted explained a total of 70.58% of the variance, with Component 1, 2, 3 and 4 explaining 23.97%, 18.19%, 14.33%, 14.02% respectively. Table 3 shows the variables and component loadings for the rotated components, with loadings less than .50 removed to enhance clarity, hence factors retained are capable of explaining above 50% of the variance. Table 3 shows the variables considered for strategy for implementing sustainable procurement and how they are loaded under each factor, the following interpretation of the results are presented below:

Factor 1: This factor is named *improved compliance and efficiency*. The study

postulated that one of the best strategies to achieving sustainable procurement practices is through total compliance with rules and regulations governing sustainability. This strategy is emphasised by Du Plessis (2007), Sourani (2008) and Akadiri and Fadiya (2013), that to achieve sustainable construction through sustainable procurement practices, compliance with government regulative measures is the recipe.

Factor 2: The variables under this cluster is named *encourage best practices*. This practice is entrenched in the definition of sustainable strategy provided by HM Government and Strategic Forum for Construction (2008). The definition emphasised that all-embracing procurement must "*achieve improved whole life value through the promotion of best practice construction procurement and supply side .... in both the public and private sectors*

and throughout the supply chain" (HM Government and Strategic Forum for Construction, 2008; p.7). the study therefore argued that practices such as ethical sourcing, client leadership as well as other factors such as valuing people will lead to sustained sustainable procurement.

Factor 3: Under this factor, the study categorised the variables as strategy for *methods appraisal and personnel training.* The proposed strategy is in tandem with the conclusion drawn by Shafii *et al*. (2006) and Al-Sanad (2015), who highlighted education and training as drivers of sustainable procurement. As this will allow contractor to have the requisite knowledge in achieving sustainability targets and also be encouraged to identify innovative ways within the budget of the client in order to meet the objectives set in terms of cost, time and quality (Naoum and Egbu, 2016).

Table 3.: Factor loadings for the Rotated Components (N = 116)

Coding	Variable Description	Mean Value	Component loading 1	2	3	4	Communalities
	Improve compliance and efficiency						
WS14	Ensuring that sustainability requirements can be clearly assessed and measured	2.82	.901				.821
WS13	Adopting a balanced approach that ensures the explicit consideration of all sustainability dimensions	2.91	.843				.826
WS16	Emphasizing the importance of sustainability in tender evaluation and selection procedures	2.88	.843				.726
WS15	Ensuring transparency in procurement decision making	3.03	.841				.753
WS12	Integrating sustainability requirements into contract specifications and conditions (including specifying any project specific sustainability requirements)	3.65	.656				.540
	Encourage best practices						
WS28	Encouraging integrated supply chains	3.25		.847			.783
WS27	Encouraging long term contractual arrangements through strategic partnering (covering a series of projects)	3.50		.834			.781
WS35	Encouraging the supply side to improve communicational and knowledge sharing with all stakeholders throughout the project life cycle	2.84		.642			.620
WS33	Utilization/enhancement of existing assessment and measurements techniques and tools to considers sustainability	2.43		.626			.758
WS25	Evaluating alternative procurement methods/routes in terms of their potential to deliver sustainability objectives	3.55			.829		.716
WS23	Requiring the employment of a property trained workforce within the supply side	3.25			.828		.789
WS24	Ensuring that payment mechanisms take account of whether sustainability requirements are delivered.	3.34			.609		.563
	Methods appraisal and personnel training						
WS31	Encouraging the Incorporation of sustainability issues into risk management	3.45				.764	.669
WS32	Provision of incentives and rewards based on sustainability performance throughout the project life cycle	3.38				.725	.581
WS18	Ensuring the competency of the people responsible for implementing and assessing sustainability issues (in both the client organisational and the supply side	3.85				-.652	.651
	Total		3.596	2.729	2.150	2.104	
	% of Variance		23.974	18.192	14.334	14.027	
	Cumulative %		23.974	42.166	56.500	70.528	

KMO= 0.877, Bartlett's Test of Sphericity =959.219 , df = 105, p =0.000
Note: 1.00-1.49 - highly unimportant, 1.50-2.49 - unimportant, 2.50-3.49 moderately important,
3.50-4.49 important, 4.50-5.00 highly important

From the analysed results, the findings indicated that there are barriers that are stunting the growth and development of sustainable construction by the Nigerian public clients which could be addressed by developing construction projects' procurement strategies.

The finding is supported by Mensah and Ameyaw (2012); Cheri and Chiriseri (2014) who identified the following as some of the barriers to sustainable procurement: Higher initial associated costs; lack of government interest; lack of social drive/responsibility; lack of public education; and lack of adequate supervision during construction among others. The results have shown that the ways of addressing sustainable construction and also assessing the level of agreement to the importance of the following factors for the Nigerian Public client which addresses sustainable procurement practices (social, economic and environmental sustainability) in developing a procurement strategy are not followed in the Nigerian construction industry.

Among majority of the different categories of respondents, ensuring compliance with regulations and government policies (for instance, Procurement Act) ranked 1st

regarding the ways of addressing sustainability in developing a procurement strategy. This is supported by Jensen (2011) who observed that even though existing processes show understanding and acceptance of the sustainable procurement concept and its related fundamentals, there has been less attention in investigating how the proper procedures should be optimized for organisational strategy and operations.

Although, it is unclear how the three elements (economic, social and environmental) should interact optimally especially for procurement decision making and implementation purposes but when carefully adopted, procurement process can be enhanced. This also agrees with Jones *et al*. (2006) and Walker and Hampson (2008) who revealed that for a performance measurement mechanism to measure the direct or indirect impact on sustainable procurement practices and show that organisational performance still lacks the fundamentals.

This to some extent explains why sustainable procurement has continued to lack total acceptance in construction practices here in Nigeria unlike in countries like EU and UK where there are favourable legal (and policy or legislation) frameworks.

Conclusion

This study provided a broad overview of the Nigerian procurement system to ascertain if sustainable practices are inherent in the current system and afterwards addressed two main objectives - barriers to sustainable practices and strategies that could be employed to integrate sustainability into the current procurement processes.

The findings indicate that lack of government commitment is a major barrier to the adoption of sustainable procurement while the best strategy for integrating sustainability into the system is through total compliance to sustainability. Generally, it is revealed that the current procurement practice in the Nigerian construction industry is yet to embrace the triple bottom line of sustainability initiatives as it places more emphasis on the economic aspect of procurement. Therefore, Nigerian Governments should join the global campaign through the review of current procurement Act to embrace sustainability.

This will assist in addressing the barriers of sustainable development through procurement practices by leveraging their impact as major customers of goods and services in the industry. And, in order to fully realise the benefit of sustainable procurement, future research is required to examine the influence of sustainable procurement on the construction project performance (in terms of cost, time-schedule and quality).

References

Abd-Wahid, S. N., Abu-Hasan, S. Z. & Ramli, Z. (2014). Developing Sustainable Procurement Framework for Malaysia Public Construction Procurement. *FIG Congress 2014 Engaging the Challenges – Enhancing the Relevance,* Kuala Lumpur, Malaysia 16-21.

AFO/OECD (2004). African Economic Outlook, 247-260 Available on http://www.africaneconomicoutlook.org/en/data-statistics/ accessed on 5th October, 2015.

Aibinu, A. A., & Odeyinka, H. A. (2006). Construction delays and their causative factors in Nigeria. *Journal of construction engineering and management, 132*(7), 667-677.

Akadiri, P. O., & Fadiya, O. O. (2013). "Empirical analysis of the determinants of environmentally sustainable practices in the UK construction industry", *Construction Innovation*, 13(4), 352-373.

Al Sanad, S. (2015). Awareness, drivers, actions, and barriers of sustainable construction in Kuwait. *Procedia Engineering,* pp. 969-983.

Ametepey, O., Aigbavboa, C. & Ansah, K. (2015). Barriers to successful implementation of sustainable construction in the Ghanaian construction industry. *Procedia*

Manufacturing, pp. 1682-1689.

Angeles, R. & Ravi, N. (2007). Business-to-business e-procurement: success factors and challenges to implementation. *Supply Chain Management: An International Journal*, 12(2), 104-115.

Berry, C. & McCarthy, S. (2011). Guide to sustainable procurement in construction, CIRIA, Classic house, London.

Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6(1), 97-113.

Chari, F. & Chiriseri, L. (2014). Barriers to Sustainable Procurement in Zimbabwe.

Child, D. (2006). *The essentials of factor analysis*. (3rd ed.). New York, NY: Continuum International Publishing Group.

Cincinnati, OH: Atomic Dog Publishing.

Coggburn, J. D. (2004). Achieving managerial values through green procurement? Public Performance and Management Review, 28(2), 236-258.

Cohen, L., Manion, L. & Morrison, K. (2005). *Research methods in education.* 5th edition. London: Taylor and Francis e-library.

Country Procurement Assessment Report (CPAR) (2000). *Nigeria Country Procurement Assessment Report (CPAR) - June, 2000. I.* Available at: www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2001/06/08/000094946_01053004005048/Rendered/PDF/multi0page.pdf. [Retrieved 15 September 2015].

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* 2nd Edition, London: Sage Publications, Thousand Oaks.

Creswell, J. W., & Plano-Clark, V.L. (2011). *Designing and Conducting Mixed Methods Research.* Canada: Sage Publication, Thousand Oaks.

Croce, N., Green, R., Mills, B. & Toner, P. (1999). *Constructing the Future: A Study of Major Building Construction in Australia.* Employment Studies Centre, University of Newcastle.

Crose, N., Green, R., Mills, B. & Toner, P. (1999). Constructing the future: a study of major building construction in Australia. Employment Studies Centre, University of Newcastle.

Dada, M. O. (2011). Teambuilding in construction project procurement: A study of traditional and integrated methods in Nigeria. *Built Environ. Journal, 8*, 1-9.

Dainty, A. (2008). Methodological Pluralism in Construction Management, In: *Advanced Research Methods in Built Environment*, Knight, A. and Ruddock, L. (Eds), United Kingdom: Wiley-Blackwell, 1-12.

Darko, A. & Chan, A. P. (2016). Review of barriers to green building adoption. *Sustainable Development.* John Wiley & Sons, Ltd and ERP Environment.

David, M. & Sutton, C. D. (2004). *Social research: The basics.* 1st edition. California: Sage Publications Inc.

Department for Environment, Food and Rural Affairs, (DEFRA) (2006). Government sustainable development strategy. *Securing the*

Future – UK, 8-15.

Du Plessis, C. (2007). A strategic framework for sustainable construction in developing countries. *Construction Management and Economics, 25(1),* 67-76.

European International Contractors (EIC), (2004). EIC Blue Book on Sustainable Procurement. European International Contractors, Germany.

Fagbenle, O. I. & Oluwunmi, A. O. (2010). Building Failure and Collapse in Nigeria: The Influence of the Informal Sector. *Journal of Sustainable Development*, *3(4),* 268-276.

Fayomi, I. O. (2013). Public procurement and due process policy in Nigeria: Thrust, prospects and challenges. *Peak Journal of Social Sciences and Humanities*, *1(4)*, 39-45.

Fellows, R. R. & Liu, A. (2008). *Research Methods for Construction* (3rd ed). Wiley-Blackwell Science, London.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics* (4th ed), Thousand Oaks, CA: Sage.

Hair J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010). *Multivariate data analysis: a global perspective* (7th ed.) Upper Saddle River, N. J.; London: Pearson Education.

HM Government and Strategic Forum for Construction (2008). Strategy for Sustainable construction.

Ibrahim, M., Krawczyk, R., & Schipporiet, G. (2004). *Two Approaches to BIM: a Comparative Study*. Presented at Education in Computer Aided Architectural Design in Europe, eCAADe 2004 Conference, Copenhagen, Denmark, September, 2004

International Institute of Sustainable Development (IISD) (2008). Sustainable Public Procurement in South Africa. Available at http://www.iisd.org/. [Retrieved 13th September 2015].

Jensen, P.A. (2011). Organisation of Facilities Management in relation to Core Business*, Journal of Facilities Management*, *9(2)*, 78-95.

Jones, P., Comfort, D. & Hillier, D. (2006). Corporate social responsibility and the UK construction industry, *Journal of Corporate Real Estate, 8,* 134-150.

Lim, B. T. H., Oo, B. L. & Ling, F. (2010). The survival strategies of Singapore contractors in prolonged recession. *Engineering, Construction and Architectural Management*, *17(4),* 387-403.

Mensah, S. & Ameyaw, C. (2012). Sustainable Procurement: The Challenges of Practice in the Ghanaian Construction Industry. *Proceedings of 4th West Africa Built Environment Research (WABER)* Conference (pp. 871-880).

Naoum & Egbu, C. (2016). Modern selection criteria for procurement methods in construction: A state-of-the-art literature review and a survey", *International Journal of Managing Projects in Business*, *9(2),* 309-336.

National Bureau of Statistics (NBS) (2008). Gross Domestic Product for Nigeria (Expenditure and Income) 2007 Q1 – 2011, NBS, Abuja. Available at:www.nigerianstat.gov.ng/pdfuploads/GDP%2520Report%2520Q2,%25202012.pdf. [Accessed on 23 June 2015].

OECD (2007). *Assessment of country's*

procurement system (Tanzania) final report. OECD Publishing. Available o n https://www.oecd.org/dac/effectiveness/40778063.pdf. [accessed 12 July 2015].

Ogunsanmi, O. E. Iyagba, R. O. A. & Omirin, M. M. (2003). A Comparative study of the Performance of Traditional and Labour-Only Procurement in Nigeria. *Journal of the Nigeria Institute of Building*, 12 – 27.

Ogunsemi, D. R. & Jagboro, G. O. (2006). Time-cost Model for Building Projects in Nigeria. Construction Management Economics, 24, 253-258.

Ojo, S. O; Adeyemi, A. Y. & Fagbenle, O. I. (2006). The Performance of Traditional Contract Procurement on Housing Projects in Nigeria. *Civil Engineering Dimension*, *8(2),* 81-86.

Omwoha, E. A. (2015). Constituents that affect the implementation of sustainable public procurement in Kenyan public universities: a case of technical university of Kenya. *The Strategic Journal of Business and Change Management, 2(9),* 144-176.

Othman, A. A. E. & Nadim, W. (2010). Towards Establishing an International Sustainability Index for the Construction Industry: *A Literature Review. Proceedings of the First International Conference on Sustainability and the Future, the British University in Egypt, Cairo*, 23-25 November 2010, pp: 222-235.

Oyewobi, L. O. (2014). Modelling performance differentials in large construction organisations in South

Africa. Unpublished PhD thesis submitted to the Department of Construction Economics and Management, University of Cape Town, South Africa.

Pallant, J. (2010). *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS for Windows,* 3rd Edition,* Open University Press. McGraw Hill, New York, NY.

Perera, O., Chowdhury, N., and Goswami, A. (2007). State of Play in Sustainable Public Procurement. International Institute for Sustainable Development, Winnipeg, MN.

Preuss, L. (2007). Buying into our Future: Sustainability Initiatives in Local Government Procurement. *Business Strategy and the Environment*, *16,* 354-65.

Roos, R. (2012). Sustainable Public Procurement Mainstreaming sustainability criteria in public procurement in developing countries. Centre for Sustainability Management (CSM) Leuphana University of Lueneburg. Available from: www.leuphana.de/csm. [accessed 15 April 2016].

Ruparathna, R. & Hewage, K. (2015a). Sustainable procurement in the Canadian construction industry: current practices, drivers and opportunities. *Journal of Cleaner Production*, 109, 305-314.

Ruparathna, R. & Hewage, K. (2015b). Sustainable procurement in the Canadian construction industry: challenges and benefits. *Canadian Journal of Civil Engineering*, *42(6),* 417-426.

Ruparathna, R. J. (2013). Emergy based procurement framework to improve

sustainability performance in construction. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Applied Science in the College of Graduate Studies (Civil Engineering), The University of British Columbia (Okanagan).

Rwelamila, P. D., Talukhaba, A. A., & Ngowi, A. B. (2000), "Project procurement systems in attainment of sustainable construction", *Sustainable Development*, *8(1),* 39-50.

Shafii, F. Ali, Z. A., & Othman, M. Z. (2006). Achieving sustainable construction in the developing countries of Southeast Asia*. In Proceedings of the 6th Asia-Pacific Structural Engineering and Construction Conference, Kuala Lumpur, Malaysia.*

Sourani, A. (2008). Addressing Sustainable Construction in Procurement Strategies. A dissertation thesis submitted in partial fulfilment of the requirements for the award of the degree Doctor of Philosophy at Loughborough University, UK.

Thai, K. V. (2001). `Public procurement re-examined. *Journal of Public Procurement, 1(1),* 9– 50.

The ABC of the Contract Due Process Policy (2005). A Manual on Public Procurement Reform Programme in Nigeria. Published by the "Nte" Agency Unit (Due Process), State House Abuja, Nigeria.

Trochim, W. M. K., & Donnelly, J. P. (2008). *The Research Methods Knowledge Base*, 3rd ed. Atomic Dog/Cengage Learning, Mason, Ohio.

United Nations, (2002). Report of the World Summit on Sustainable Development. United Nations, New York.

Uyarra, E., & Flanagan, K., 2010. Understanding the Innovation Impacts of Public Procurement. *European Planning Studies*, *18 (1),* 123-143.

Walker, D. H. T. (1997). Choosing an appropriate research methodology. Construction Management and Economics, *15(2),* 149-159.

Walker, D., & Hampson, K. (2008). *Procurement Strategies: A Relationship based Approach*. John Wiley and Sons, London, UK.

Walker, H., Brammer, S., (2009). Sustainable procurement in the United Kingdom public sector. *Supply Chain Management: An International Journal*, *14,* 128-137.

Walsh, K., & Sawhney, A. (2002) *International comparison of costs for the construction sector: towards a conceptual model for purchasing power parity*. The World Bank Group.

Wild, N., & Li, Z., (2011). Ethical procurement strategies for international aid non-government organizations. *Supply Chain Management: International Journal*, *16(2),* 110–127.

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology, 9(2),* 79–94.