

## Building Materials: Research, Creativity and Development

<b>REGISTRATION FEE</b>	<b>SUB - THEMES:</b>
<b>MEMBERS: N10,000.00</b>	1. Imperatives of the New Normal.
<b>STUDENTS &amp; NYSC MEMBERS: N5,000.00</b>	2. Materials Development and Sustainability.
<b>NON MEMBERS: N15,000.00</b>	3. Waste to Wealth in Building Materials Development.
Register Here: <a href="http://www.niobnat.org">www.niobnat.org</a>	4. Materials Development in the Building Ecosystem.
<b>DATE:</b> Wednesday, 7th & Thursday, 8th October, 2020	5. Investment in Materials Research and Development.
	<b>10:00AM</b> WEST AFRICA TIME
	<b>CPD UNITS: 12</b>



THE NIGERIAN INSTITUTE OF BUILDING (MOB)  
 50<sup>TH</sup> CONFERENCE AND ANNUAL GENERAL MEETING  
 HELD ON WEDNESDAY 7<sup>TH</sup> - THURSDAY 8<sup>TH</sup> OCTOBER 2020  
 THEME: BUILDING PRODUCTION AND STRUCTURAL STABILITY

**Wednesday 7<sup>TH</sup> OCTOBER 2020**

PERIOD	TIME	ACTIVITY
5 mins	10:00-10:05 am	National Anthem
5mins	10:05-10:10 am	Welcome Address by Chairman Conference Planning Committee
10 mins	10:10-10:20 am	Welcome Address by President NIOB
10mins	10:20-10:30 am	Opening Remark by Chairman of the Occasion (FCT Minister)
10mins	10:30-10:40 am	Keynote Address by Minister of Works and Housing
10mins	10:40-10:50 am	Recognition of VIPs and Goodwill Messages
5mins	10-50-10:55 am	Closing
		<b>Technical Session</b>
10mins	11:00-11:10 am	<b>Paper 1:</b> Effects of Mix Ratios on the Characteristics of RISS Concrete (Bldr. Oluwaleke Oluwu)
	11:10-11:20 pm	<b>Paper 2:</b> Influential Factors Driving Material Sourcing for Sustainable Construction Practice (Bldr. (Dr.) Dodo Mansir)
10 mins	11:20-11:30 am	<b>Paper 3:</b> An Evaluation of Nigerian Pumice Tuffs as Potential Pozzolanic Materials for Cement Blending (Dr. D. W. Dudu)
10 mins	11:30-11:40 am	<b>Paper 4:</b> Periwinkle Shell Ash as Cementitious Material for Sustainable Concrete Production (Bldr. Prof. Akaninyene A. Umoh)

10 mins	11:40-11:50 pm	<b>Paper 5:</b> Research Effort of NBRRI in The Areas of Building Materials Development – The Challenges and Prospects. (Engr. (Dr.) Nurain Sulymon)
10 mins	11:50-12:00 noon	<b>Paper 6:</b> Sustainable Cement Replacement in Concrete and Mortar for Effective Low Cost Housing Delivery (Bldr. (Prof.) Akeem A. Raheem)
10 mins	12:00- 12:10 pm	<b>Paper 7:</b> Waste to Wealth in Building Materials Development (Bldr. Joseph Anejo)
10 mins	12:10- 12:20 pm	<b>Paper 8:</b> Influence of Nut Oil Extracts On Properties of Cement Paste and Mortar (Bldr. Ifiok Ekop)
10 mins	12:20- 12:30 Pm	<b>Paper 9:</b> Strength Characteristics of Rice Husk Ash and Corn Cob Ash Blended Cement Concrete (Bldr (Dr.) Alake Olaniyi)
10 mins	12:30- 12:40	<b>Paper 10:</b> Material Development in the Building Ecosystem (Bldr. (Dr.) James Olawuyi)
10 mins	12:40-12:50	<b>Paper 11:</b> Strength Development and Elastic Modulus of Eco-Bricks Masonry (Bldr. Emmanuel Uche)
10 mins	12:50- 1:00pm	<b>Paper 12:</b> Applying Powder of Waste Rubber Tire to Bitumen for Sustainable Construction (Bldr. (Dr.) Samaila Adamu)
30 mins	1:00- 1:30pm	<b>Break</b>
10mins	1:30-1:40pm	<b>Paper 13:</b> Combating Sulphate Attack with Waste Materials (Bldr. (Dr.) ATA Olugbenga)
	1:40-1:50pm	<b>Paper 14:</b> Strength and Permeation Resistance of Cements Made from Local Waste Materials (Bldr. (Dr.) Folagbade Samuel Olufemi)
	1:50-2:50pm	Questions and Answers Closing
Thursday 8 <sup>th</sup> October 2020		AGM

Paper AGM 002

## **Influential Factors Driving Material Sourcing for Sustainable Construction Practice**

**Mansir Dodo.<sup>1\*</sup>, Muawiya Abubakar<sup>2</sup> and Abubakar D. Abdul Azceez<sup>3</sup>**

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### **ABSTRACT**

The construction industry is characterised to being highly resource dependent. Owing to the spiralling cost of resource processing as well as dwindling resources globally, sustainable construction emerged as a concept to optimise the use of resources in construction. Ever since its emergence, sustainable construction has been researched upon from several approaches such as: space management; energy and water efficiency of buildings; and waste management among other approaches. While these approaches are deemed to be rather specific, a sustainable construction approach deemed to be more generic is the use of alternative sustainable materials because most often than not, implementing the specific approaches relies on the use of construction materials that are sustainable. Although there exist researches on sustainable construction materials in Nigeria, not much exist on the influential factors driving the sourcing of sustainable construction materials which is key to successful construction project delivery. As such, this research investigates the influential factors driving the sourcing of construction materials for sustainable construction practices. Primary data is collected through conducting a survey with the aid of a structured questionnaire using purposive sampling from 61 postgraduate students in the Department of Building Ahmadu Bello University Zaria Nigeria. The procedure for data analysis is both descriptive and inferential using IBM SPSS Statistics 23 as well as MS Excel to compute the Mean Score as well as the Relative Index (RI). Out of the 61 questionnaires distributed, only 48 were used for analysis. Results indicate that all the respondents believe that all influential factors studied drive sustainable construction. This study found that while 'environmental impact' and 'material quality' are the most influential factors always driving material sourcing in sustainable construction, instances prevail whereby 'compliance to statutory regulations and laws', 'available specialist skills to use material for sustainable construction' and also 'incentive in the use of sustainable material' never drive material sourcing in sustainable construction. The study concludes by asserting that professionals in the construction industry rely on various influential factors to drive their decision on material sourcing in sustainable construction. There is need to invest more efforts on enforcing material compliance to regulations, developing skills to use material for sustainable construction and provide more incentives in the use of sustainable materials. Future studies can cover influential factors specifically categorised according to the three dominant pillars of sustainable practice which are social, economic and environmental. Also, more indepth relationships between and among the influential factors may be explored.

**Keywords:** Influential factors; Material sourcing; Sustainable construction.

# Influential Factors Driving Material Sourcing for Sustainable Construction Practice

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Keywords: Influential factors; Material sourcing; Sustainable **construction**.

## 1.0 INTRODUCTION

Globally, the construction industry is characterised to not only being highly resource dependant, but also, experience variations and fluctuations in resources used based on the usually long duration in executing a construction project compared to projects in other industries. With resources becoming more scarce, the concept of sustainable construction is becoming an area of concern. According to Ofori & Foor (2012), sustainable construction refers to designing constructed items and planning construction activity to ensure that the process and its products are sustainable in broadly defined terms. Similarly, Practical Recommendations for Sustainable Construction PRESCO (2018) report that the European Union (EU) defines sustainable construction as the use and/or promotion of environmentally friendly materials, energy efficiency in buildings as well as management of construction and demolition waste. Both these definitions inform that the concept of sustainable construction cuts across design and construction of any construction project as well as new or retrofit construction project.

There exist several efforts to promote sustainable construction by statutory authorities. In Canada for instance, Canada's Federal Housing Agency offered a performance based model for sustainable construction (Practical Recommendations for Sustainable Construction PRESCO, 2018). In UK as well, the UK national guidelines for sustainable construction guides the implementation of sustainable construction (Xia, Olanipekun, Chen, Xie, & Liu, 2018). In Russia also, there is a wide movement to sustainable construction in terms of multi-level programs designed to become a transition to sustainable construction (Practical Recommendations for Sustainable Construction PRESCO, 2018).

Similar to these efforts by statutory authorities, there is growing interest among researchers on sustainable construction. While such growing interests have yielded numerous researches, existing researchers adopt different approaches to sustainable construction. Some authors have approached sustainable construction relative to space management (Steiner, 2005). Others take the approach of material waste minimization (Formoso, Soibelman, Cesare, & Isatto, 2002). Also, other researches embark on an approach relative to alternative sustainable materials (Sajane, Agam, Patil, Shirgave, & Pituk, 2017; Shoubi, Shoubi, & Barough, 2013; Kapoor, Jena, & Govil, 2012). Equally, other researchers choose to approach sustainable construction on the basis of energy and water efficiency of buildings (Piper, 2017; Harun & Ghafar, 2003). Even though the scope of these research approaches to sustainable construction differ, they however all unanimously aim for resource optimization in construction.

Resources optimised in sustainable construction vary based on the scope of construction project. Irrespective of the variability however, bulk of the resources are material resources. This is confirmed from the generic model of sustainable construction proposed by Practical Recommendations for Sustainable Construction PRESCO (2018) whereby the role of material resources in sustainable construction is stressed upon to being key to sustainable construction. Based on such, issues pertaining to material sourcing (among other processes in material management) are key to achieving successful construction project delivery in sustainable construction. This is attested by Kasim (2008) where the author claims that purchasing materials from the best source, at the right price and with timely delivery is key to successful construction project delivery. Although there exist researches on sustainable construction materials in Nigeria (such as Mansir, Gambo, Yar'adua, & Abduljabbar, 2019; Ede, Alegiuno, & Aawoyera, 2014; and also Ibrahim, Bankole, Ma'aji, Ohize, & Abdul, 2013 among others), not much exist on the influential factors driving the sourcing of sustainable construction materials. As such this research investigates the influential factors driving the sourcing of construction materials for sustainable construction practices.

## **2.0 LITERATURE**

The subsequent sub-sections begins by discussing sustainable construction. Afterwards, factors driving material sourcing for sustainable construction are articulated.

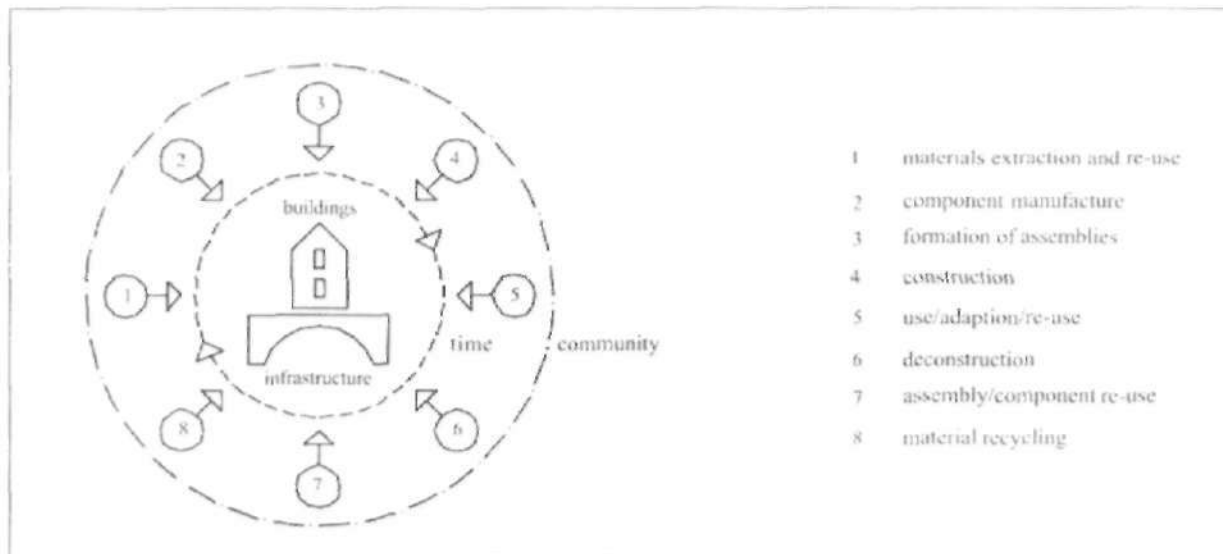
### **2.1 Sustainable Construction**

Over the last decade, there has been wide discussions on sustainable construction. Although the reasons for such discussions vary, Briga-Sá et al. (2013) are of the opinion that taking into account that the construction sector carries out a high consumption of resources such as materials, energy, and water, it is imperative for the use of more sustainable construction solutions. There exist several definitions of sustainable construction. For instance, Practical Recommendations for Sustainable Construction PRESCO (2018) defines sustainable construction as a wide array of criteria about how to build in a sustainable way. Also, Ofori & Toor (2012) defines sustainable construction as designing constructed items and planning construction activity to ensure

that the process and its products are sustainable in broadly defined terms. Irrespective of the definition of sustainable construction, the goal is to primarily optimise resource. In other words, sustainable construction should aim at keeping the total cost of construction on a reasonable (minimum) level and also, social and cultural aspects of construction at a feasible (maximum) quality. In line with such definitions, Practical Recommendations for Sustainable Construction PRESCO (2018) outlines some goals of sustainable construction which include:

- a. Decrease exhausting of primary raw materials and energy;
- b. Regulate consumption of renewable resources;
- c. Decrease the amount of harmful emissions and wastes;
- d. Increasing the structure's serviceability, durability and reliability throughout its entire life.

Resulting from the interests of authors on sustainable construction, several approaches to its implementation have been researched upon. While some researches on sustainable construction focus on alternative sustainable materials such as Expanded Polyesterene (EPS) or plastic bottles (such as Sajane et al., 2017; Shoubi et al., 2013; and also Kapoor et al., 2012), others focus on energy and water efficiency of buildings (such as Piper, 2017; and also Harun & Ghafar, 2003). Also, while some researches approach sustainable construction relative to space management (such as Steiner, 2005), others take a material waste minimization approach (such as Formoso et al., 2002). Irrespective of the approach however, Practical Recommendations for Sustainable Construction PRESCO (2018) stresses that sustainable construction should be generic and not context specific whereby they proposed that sustainable construction be approached as a closed loop process as is depicted in Figure 1.



**Figure 1: Closed loop Paradigm for Sustainable Construction**  
(Practical Recommendations for Sustainable Construction PRESCO, 2018)

From this illustration, the approach to resources used in construction are in a continual cycle of extraction, production, recovery and recycle. Although this model of sustainable construction could have universal application, its adoption particularly in developing countries is timely due to the scarcity of resources relative to the wide infrastructural gap which calls for sustainable construction practice.

## 2.2 Material sourcing for sustainable construction

Similar to manufacturing and other production processes, construction involves the use of numerous materials to produce a product. Unlike other production/manufacturing projects however, construction projects are characterized by longer duration and variable scope thereby, materials to be used are subject to variations and fluctuations. Planning for material sourcing in a construction project as such, should have an optimal strategy (Said & El-rayes, 2011). Whatever strategy adopted must consider obtaining information on the demand and supply of the material to source.

In certain cases, sourcing materials to use in a construction project involves taking certain decisions usually guided by certain influential factors. In the material sourcing process, these influential factors are key to getting the optimal value of materials to use for any construction project. According to Kasim (2008), purchasing materials from the best source, at the right price and with timely delivery is key to successful construction project delivery. In other words, making the right material sourcing decision has a significant role to play in achieving the desired quality, optimizing cost and timely completion of any construction project. Several authors have identified influential factors driving material sourcing in construction projects. Table 1 is a summary of the influential factors.

**Table 1: Influential Factors Driving Material Sourcing in Construction Projects**

S/No	Factor	Authors
1	Locally sourced	EPS-Industry-Alliance (2017); Samuel & Eziyi (2014); Slater, Heath, Peng, Dan, & Choi (2012); King (2012); Susan (2010)
2	Compliance of material to statutory regulations and laws	Frazier et al. (2018); Sim & Puthena (2015); Rawat & Kansal (2014); Paoletta & Grifoni (2013); University of Maryland (2009),
3	Incentive in the use of sustainable material	OAS Cataloging-in-Publication Data (2016); Karki (2013); Paoletta & Grifoni (2013); Al-Hajj & Hamani (2011); Hussin (2006)
4	Sustainable market of a material	University of Nebraska (2011); Nazali & Pitt (2009)
5	Available specialist skills to use sustainable material for construction	Bilau, Witt, & Lill (2015); Kasim (2007)
6	Potential of being recycled	Sulciman (2018); Greene (2014); Briga-Sá et al. (2013); Kapoor et al. (2012); Samper, Garcia-Sanoguera, Parres, & López (2010); Ofori (2001)
7	Environmental Impact	Niranjan, Rushikesh, Sahil, & Omkar (2018); Nishad, Parthe, Rathod, Yadav, & Neha (2018); Shoubi et al. (2013); Slater et al., (2012); Smriti (2010); Samper et al. (2010); Li, Chen, Yong, & Kong (2005); Graettinger, Johnson, Sunkari, Duke, & Effinger (2005), Formoso et al. (2002); Faniran & G. (1998)
8	Material Quality	Daramola, Oni, Ogundele, & Adesanya (2016); Elkhaliifa (2015); Hassan & Harun (2013); Shoubi et al. (2013); Raghuchandra, Vatsalya, Dutta, & Bhanuprakash (2004)

It is important to state that these influential factors are not exhaustive. Equally, it is worthy to note that the extent to which each of these influential factor impact sustainable construction varies across researches of the different authors.

## 3.0 METHODOLOGY

Primary data for this study is collected using a survey technique. The data collection instrument is a structured questionnaire developed specifically for this study based on influential factors deemed to being drivers of



sustainable construction obtained from previous studies (presented in Table 1). The questionnaire consists of two sections. The first section sought to fetch data on the demographics of the respondents. While the second section sought to fetch data by means of gauging the frequency to which respondents believe each influential factor is a driver of sustainable construction. Questions of the second section of the questionnaire is designed to be answered on a 5-point Likert-type response scale with ratings as follows: Always (5); Often (4); Sometimes (3); Rarely (2); and Never (1). This 5-point Likert-type response scale is recommended for use by: John & Itodo (2013); Brown (2010); Field (2009); Saunders, Lewis, & Thornhill (2009); and also Xie, Thorpe, & Baldwin (2000).

Purposive sampling is used in selecting the respondents. The choice of such non-probability sampling is informed by the claim of Cohen, Manion, & Morrison (2007) that it is employed when a sample is selected for a specific purpose or need. Similarly, Kumar (2011), Saunders et al. (2009), Lavrakas (2008) and also Kothari (2004) all report that a researcher can use this technique if selection is based on likely people who can provide the required information (or have expert knowledge) to achieve the objectives of a study. Likewise, Saunders, Lewis, & Thornhill (2009) recommend purposive sampling when a researcher wish to select respondents that are particularly informative in fulfilling the research objectives. Since this research covers those who have experience on sustainable construction practices, 61 postgraduate students enrolled in Masters in Facilities Management and also Post graduate Diploma in Building in the Department of Building Ahamdu Bello Univeristy Zaria Nigeria constitute the respondents for this study. The choice of selecting these PG students is based on the premise that they either offer courses covering aspects of sustainable construction or have experience in sustainable construction practices.

The tool for data analysis is IBM SPSS Statistics 23. The procedure for data analysis is both descriptive (using frequency and Mean Score) and inferential (by relating and comparing ratings of the influential factors studied). This Mean Score is computed using the equation obtained from researches of John & Itodo (2013), Samuel & Eziyi (2014), Chan & Hou (2015) and also Ejohwomu et al. (2017) whereby they express it as:

$$\bar{X} = \frac{\sum X_i}{n}$$

whereby:  $\bar{X}$  denotes the Mean Score  
 $\sum X_i$  is the sum of the number of responses and score awarded a variable ( $V_i$ ; for  $5 \geq V_i \geq 1$ )  
 $n$  denotes the total number of responses

Additionally, MS Excel is used to compute the Relative Index (RI) which serves as a basis to rank the frequency to which respondents believe each influential factor is a driver of sustainable construction. The suitability in using RI on frequency is obtained from the works of (Holt, 2014) as well as (Joshi, Kale, Chandel, & Pal, 2015) where they express RI as:

$$RI = \frac{1n_1 + 2n_2 + \dots + An_A}{AN} \quad (0 \leq RSI \leq 1)$$

Where:

$n_1, n_2, \dots, n_A =$  number of respondents scoring response stem integers 1 to  $A_{max}$  (5), respectively.

$A =$  largest integer on the response item (5 for this research)

$N =$  total number of respondents

The Mean Score obtained is used as a basis to ascertain where each driver of sustainable construction practice leans towards on the 5 point scale used. Furthermore, the proportion of the respondent scoring above

or below the median value is computed. Such analysis helps in drawing inferences from the scoring profiles for each frequency to which respondents believe each influential factor is a driver of sustainable construction (refer to Holt, 2014; Joshi, Kale, Chandel, & Pal, 2015; Bishop & Herron, 2015; Carifio & Perla, 2007; and Harpe, 2015).

#### 4.0 RESULTS

Out of the 61 questionnaires distributed and retrieved, a total of 49 questionnaires were retrieved. However, only 48 questionnaires had complete data suitable for analysis. The results of the demographics for this study are presented in Table 2. The proportion of the respondents are: Architects, 13; Builders, 14; Civil Engineers, 8; Quantity Surveyors, 11; and other professionals, 2. While over 68.75 percent of the respondents have working experience of over 5 years and more, 31.25 percent have working experience of 5 years and below. Similarly the proportion of the highest academic qualification of the respondents are: HND, 21 respondents; B. Sc., 21 respondents; and PGD, 6 respondents. Also, the first source of awareness on sustainable construction in descending order are: seminars/workshops/classes, 17 respondents; personal research, 15 respondents; media (social, print among others), 8 respondents; co-workers/colleagues, 7 respondents; and client, 1 respondent.

**Table 2: Demographics of Respondents**

Demography	Number of respondents	Percentage
<b>Profession of respondents</b>		
Architect	13	27.08
Builder	14	29.17
Civil Engineer	8	16.67
Quantity Surveyor	11	22.92
Other professionals	2	4.12
<b>Total</b>	<b>48</b>	<b>100</b>
<b>Working Experience (years)</b>		
0-5	15	31.25
6-10	15	31.25
11-15	12	25
16 years and above	6	12.50
<b>Total</b>	<b>48</b>	<b>100</b>
<b>Highest educational qualification</b>		
HND	21	43.75
B.Sc	21	43.75
PGD	6	12.50
<b>Total</b>	<b>48</b>	<b>100</b>
<b>First source of awareness on sustainable construction</b>		
Personal research	15	31.25
Seminars/workshops/classes	17	35.42
Media (social, print among others)	8	16.67
Co-workers/colleagues	7	14.58
Client	1	2.08
<b>Total</b>	<b>48</b>	<b>100</b>

Table 3 depicts the results of the 8 drivers of sustainable construction studied. While Environmental Impact ranked 1<sup>st</sup> (with a Mean Value of 4.54; RI of 0.91), ‘material quality’ ranked 2<sup>nd</sup> (with a Mean Value of 4.19; RI of 0.84). Also, while ‘potential of being recycled’ ranked 3<sup>rd</sup> (with a Mean Value of 4.08; RI of 0.82), ‘locally sourced’ ranked 4<sup>th</sup> (with a Mean Value of 3.96; RI of 0.79). Furthermore, while ‘compliance

of material to statutory regulations and laws’ ranked 5<sup>th</sup> (with a Mean Value of 3.90; RI of 0.78), ‘sustainable market of a material’ ranked 6<sup>th</sup> (with a Mean Value of 3.71; RI of 0.74). Also, while ‘available specialist skills to use sustainable material for construction’ ranked 7<sup>th</sup> (with a Mean Value of 3.67; RI of 0.73), ‘incentive in the use of sustainable material’ ranked 8<sup>th</sup> (with a Mean Value of 3.50; RI of 0.70).

**Table 3: Results of the Frequency of Influential Factors Driving Material Sourcing**

Influential factors	Frequency of responses					Total	Scores below median	Scores above median	Mean Score	RI	Rank
	5 A	4 O	3 S	2 R	1 N						
Environmental Impact	28	18	2	0	0	48	0	46	4.54	0.91	1 <sup>st</sup>
Material quality	18	21	9	0	0	48	0	39	4.19	0.84	2 <sup>nd</sup>
Potential of being recycled	20	17	6	5	0	48	5	37	4.08	0.82	3 <sup>rd</sup>
Locally sourced	19	13	11	5	0	48	5	32	3.96	0.79	4 <sup>th</sup>
Compliance of material to statutory regulations and laws	14	20	10	3	1	48	4	34	3.90	0.78	5 <sup>th</sup>
Sustainable market of a material	12	13	20	3	0	48	3	25	3.71	0.74	6 <sup>th</sup>
Available specialist skills to use sustainable material for construction	15	13	10	9	1	48	10	28	3.67	0.73	7 <sup>th</sup>
Incentive in the use of sustainable material	10	13	17	7	1	48	8	23	3.50	0.70	8 <sup>th</sup>

**Legend:** 5- Always, 4- Often, 3- Sometimes, 2- Rarely, 1- Never

Results of scores below and above the median also show that among all influential factors studied, there exist one respondent each that believe ‘compliance of material to statutory regulations and laws’, ‘available specialist skills to use material for construction’ and also ‘incentive in the use of sustainable material’ all have likelihood of not driving material sourcing. Additionally, results of the Mean Score show that on the average, ‘environmental impact’ is an influential factor that has very high likelihood to ‘always’ driving material sourcing for sustainable construction. Furthermore, all other influential factors studied have a high likelihood to ‘often’ drive material sourcing for sustainable construction.

## 5.0 FINDINGS, CONCLUSION AND RECOMMENDATIONS

This study found that almost all the respondents believe that all the influential factors studied drive sustainable construction. This is encouraging considering 87.50 percent (over three-quarter) of the respondents are barely halfway into their career implying that they have more decades to practice and contribute to sustainable construction. This is equally encouraging considering 47.92 percent (almost half) of the respondents gained awareness of sustainable construction on their personal efforts. This study found that while ‘environmental impact’ and ‘material quality’ are the most influential factors always driving material sourcing in sustainable construction, instances prevail whereby ‘compliance to statutory regulations and laws’, ‘available specialist skills to use material for sustainable construction’ and also ‘incentive in the use of sustainable material’ never drive material sourcing in sustainable construction. It may be concluded that professionals in the construction industry rely on various influential factors to drive their decision on material sourcing in sustainable construction. There is need to invest more efforts on enforcing material compliance to regulations, developing skills to use material for sustainable construction and provide more incentives in the use of sustainable materials. It is worthy to state that the influential factors covered in this study deemed to be drivers of material sourcing for sustainable construction practices are by no means exhaustive. Future studies

can cover influential factors specifically categorised according to the three dominant pillars of sustainable practice which are social, economic and environmental. Also, more indepth relationships between and among the influential factors may be explored. Similarly, rather than studying employees that are predominantly graduates, a study of a mixture of employees with formal, semi-formal and no formal educational qualification may reveal interesting results on diversity in construction projects. This is important considering the fact that a large number of the workforce in construction projects have semi-formal or no formal educational qualification.

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