ISSN: 2524-1354 (Online), ISSN: 2519-7851 (Print)
Africa Habitat Review Journal
Volume 14 Issue 3 (December 2020)
http://uonjournals.uonbi.ac.ke/ojs/index.php/ahr

Sustainable Construction Literacy:

A Study of the Kenyan Interior Design Market Segment of the Construction Industry

Samuel Kamau Joseph* and Anthony Oduor Ralwala

Received on 9th July, 2019; Received in revised form 7th October, 2020; Accepted on 19th October, 2020.

Abstract

Due to the widespread calls for the construction industry to adopt sustainable approaches, the various stakeholders are now engaging in the sustainability agenda more than before. This study investigated how the Kenyan construction industry is engaging the sustainability agenda. Specifically, this study sought to establish sustainable construction (SC) literacy levels, key sustainability considerations and SC literacy avenues in the interior design market segment of the Kenyan construction industry. Key project stakeholders in the interior design market segment of the Kenyan construction industry were the target population. A total of 60 (12 architects/interior designers, 12 electrical engineers, 12 mechanical engineers, 12 quantity surveyors and 12 contractors) structured questionnaires were distributed, out of which 46 (10 architects/interior designers, 9 electrical engineers, 9 mechanical engineers, 8 quantity surveyors and 10 contractors) were received back. Collected data was analysed using frequencies, percentages, mean item scores (MIS) and standard deviations (SD). The study revealed an average level of sustainability literacy with a composite mean score of 3.7102 and mismatch between SC literacy levels and key sustainability considerations in interior design projects. Additionally, the respondents rated standard SC approaches, legislation, policies and construction trade associations as the least effective contributors to their current SC literacy levels. On the other hand, informal learning, construction professional associations influence, collaboration amongst firms, and formal learning were largely attributed to the respondent's SC literacy levels. The implication of the findings was that there is need to fine-tune SC literacy drives to the peculiarities of the various industry market segments to ensure their effectiveness in informing practice. Additionally, there is the need to leverage standard SC approaches, legislation, policies and construction trade associations as avenues to improve the overall sustainability literacy levels.

Keywords: Interior design, Kenya, Sustainability, Sustainable construction, Sustainability literacy.

INTRODUCTION

Du Plessis (2002), postulates that the construction industry, with special reference to developing countries as is the case for Kenya, has been identified to result in vast negative sustainability impacts. These impacts are; of economic nature such as cost of constructed facilities and proportion of labour employed in the construction industry, environmental nature such as demand for natural resources, and energy consumption in processing of construction products, and social nature such as corruption and unfair labour practices (Macozoma, 2002). The situation is further complicated by the numerous direct and indirect linkages between the construction industry and other industries (Du Plessis, 2002).

Numerous scholars have pursued matters in relation to aspects of sustainability literacy, uptake and assessment- specifically in the construction industry- in various countries such as Turkey, Nigeria, Australia, England and Cyprus (Usal, 2012; Ikediashi at al., 2013; Khalfan et al., 2015; Higham & Thomson, 2015; Elmualim & Alp, 2016). These efforts display global efforts towards enriching the theory, and consequently the practice, of sustainability within the construction industry. In addition, analysis of previous research in relation to sustainable construction shows limited coverage of the interior design market segment sustainability related endeavours compared to general architectural ones (Jones, 2008; Keane, 2009; Hayles, 2015). Most of the

**Corresponding author:*
***Samuel Kamau Joseph**, Department of Construction Management and Quantity Surveying, University of Nairobi, Kenya.*
Email: skksamwel@uonbi.ac.ke

information, legislation and assessment tools have been largely geared towards architectural projects, though some aspects are still applicable to interior design projects.

In the course of planning, designing, executing and post-construction support in interior design projects (fit-outs and retro-fits), interior designers require the input of other professionals. The main ones are quantity surveyors, electrical engineers and mechanical engineers. However, over time, given the rising complexity in interior design projects, additional professionals are required on an 'as and when required' basis. These include, but are not limited to: lighting consultants/designers, structural engineers (where structural alterations are involved), security professionals, construction project managers and construction project administrators. The conduct of these professionals in interior design projects in Kenya is largely governed by consultancy agreements. However, the general oversight of these professionals is undertaken by the respective professional bodies such as Engineers Board of Kenya (EBK) for engineers, and the various Acts of Parliament and parastatals that regulate various aspects of the built environment.

Apart from consultants, there are other stakeholders in interior design projects. Amongst them are the project clients/employers who engage the consultants/professionals (discussed above) and the construction team. The construction team is typically composed of contractors (domestic and/or nominated) and can be ordinary fit-out contractors and/or specialists, sub-contractors (domestic and/or nominated) and suppliers (domestic and/or nominated). For contractors, their conduct in interior design projects in Kenya is largely governed by contract agreements; for example, the Joint Building Council (JBC) conditions of contract for building works, and sub-contract agreements such as Kenya Association of Building and Civil Engineering Contractors Association (KABCEC). The general oversight of these entities is undertaken by National Construction Authority (NCA) and the respective county governments (for the jurisdiction in which the construction works are being undertaken).

The above imply a call for inclusion of the interior design market segment in construction industry sustainability related endeavours. Interior design market segment in Kenya is yet to have an oversight structure as in other countries such as Britain, USA, Australia, China, Brazil, Nigeria and South Africa (Mwanza, 2013). It is clear that construction industry, if unchecked, has the potential of compromising the ability of both the current and future generations to meet their needs. Additionally, as postulated by Lockhart (2016), Target 4.7 of the sustainable development goals (SDGs) aims at improving sustainability literacy for all via all the available modalities (whether formal, informal and/or non-formal, or any other combination).

It is in line with these realizations that this study explored the role of sustainability literacy as a key contributor to SC compliance in the Kenyan construction industry. This paper sought to establish sustainability literacy levels, key sustainability considerations and effectiveness of the various sustainable literacy avenues in the Kenyan interior design market segment of the construction industry. This study focused on professional interior design practice; where the involved parties, as engaged by developers, are professionals in their respective fields.

THEORY

Sustainability refers to the ability of the present generation to meet their own needs (Intra-generational equity) without compromising the ability of future generations to meet their own needs (Inter-generational equity). This definition covers the associated economic, environmental and social aspects in a given context (Brundtland, 1987; Carboni et al., 2018). Sustainability endeavours in the construction industry have been termed as sustainable construction (SC). Du Plessis (2002), refers to sustainable construction as the total process that ensures and maintains balance between the built and natural environments (environmental considerations) while at the same time upholding human dignity (social considerations) and ensuring economic equity amongst the populace (economic considerations).

A number of measures have been put in place towards achieving sustainability as an end product of sustainable development practices. This has been driven by the vast negative impacts associated with human activities such as construction. These measures have been identified to range from formal global recognition of the need to pursue sustainable development (Brundtland, 1987), global sustainability agendas such as Sustainable Development Goals (SDGs) (United Nations Development Programme (UNDP), 2017) and localized sustainable development pursuits such as Vision 2030 in Kenya (UNDP, 2012), matters economics, local legislation such as Environmental Management and Conservation Act (EMCA) (1999) that is concerned with environmental matters and Employment Act (2007), largely concerned with social matters; to mention but a few.

The construction industry is a major sector in any economy. It is used by governments to regulate the economy through monetary and fiscal actions (Bosher et al., 2007). The industry is also labour intensive, hence a major employer. The industry is also characterized by many forward and backward linkages with other industries (Construction Products Association, 2007). Compliance with the economic aspects of sustainability can help investors to; avoid increased exposure to green taxes, safeguard their reputation and avoid resistance from pressure groups (Adetunji et al., 2003). In addition, according to Kats (2003), the benefits of observing this principle of compliance with economic sustainability include; rationalized operating and maintenance costs and increased revenue which can be realized through sale and/or rent of constructed facilities.

According to Tam et al. (2006), construction activities impact on the environment through its activities, such as use of natural resources, and through its waste products like dust and gas emissions. Construction also impacts on the environment through energy consumption. It is estimated that construction uses 40% of the total energy produced (Cheng et al., 2008). According to Kats (2003), if observed, this principle of compliance with environmental sustainability can be associated with improved quality of the surroundings and rationalized use of natural resources and energy. The environment aspect of sustainable construction is fairly well researched and more advanced than the social and economic aspects. This could explain the availability of well-established environmental management systems (UK Green Building Council, 2009).

According to Adetunji et al. (2003), social aspects are concerned with the legal and moral obligations of the construction industry to its stakeholders such as employees, suppliers, and the community in which it operates at large. Non-compliance with the social concerns has seen the construction industry being branded as dirty, disruptive, dangerous, old fashioned and sometimes dishonest (Addis & Talbot, 2001; Myers, 2005). Also, the quality of spaces should not have negative effects on the users such as poor indoor air quality leading to diseases such as cancer (Baum, 2007; Kibert, 2008). According to Kats (2003), the benefits of observing this principle of compliance with social sustainability include; enhanced wellbeing, reducing absenteeism from work, reduced rate of employee turnover and reduced liabilities.

Construction activities have been associated with negative impacts of economic, environmental and/or social nature as discussed in preceding sections. To counter such negative impacts and to realize the numerous benefits associated with sustainable development (SD), requisite skills and knowledge are required to guide practice. This is meant to facilitate a paradigm shift, as postulated by Murray & Congrave (2007), amongst the construction industry stakeholders towards a comparatively sustainable construction industry. According to Murray & Congrave (2007), there is increased need for sustainability literate professionals in efforts geared towards having a planet that meets the needs of the current generation without compromising the ability of future generations to do so. Literacy is defined by Dale & Newman (2005) as the mastery/proficiency of skills and/or subject matter in context.

As such, sustainability literacy has been defined as mastery/proficiency of sustainability skills and knowledge aimed at fostering practices that ensure the planet meets the needs of the current generation without compromising the ability

of future generations to do so (Joseph, 2019). According to Lockhart (2016), learning can be formal, informal and/or non-formal education, or any other combination. Formal education/learning involves well identified and assessable inputs, for example tutors, processes such as teaching methodologies, and outcomes like knowledge and skills. Informal learning is done outside institutions and is unstructured. It is basically acquisition of knowledge and skills through experience. Non-formal learning is a middle ground between formal and informal learning with clear outcomes and is semi-structured. However, formal avenues of sustainability education have received more scholarly attention compared to informal and non-formal ones.

Construction professionals' associations have been seen to encourage sustainability literacy. This has largely been through continuous professional development (CPD) programmes and influencing incorporation of sustainability issues in degree courses (Murray & Cotgrave, 2007). In lieu of formal sustainability education, some professionals adopt standard sustainability approaches such as Building Research Establishment Environmental Assessment Method (BREEAM) and/or engage sustainability specialists (Schweber, 2013). According to Gleeson & Thomson (2012), promotion of sustainability literacy involves a combination of developing required skills and knowledge as well as changing practitioners' mind-set and culture. Higham & Thomson (2015) postulate that formal learning is insufficient to stimulate desired sustainability literacy levels. As such, other available modalities of learning should be explored in efforts geared toward a sustainability compliant construction industry.

Gleeson & Thomson (2012) postulated that collaboration, policies and legislation, formal learning, informal learning and influence of trade and professional bodies are some of SC literacy avenues. Sommerville & McCarney (2003) explained that collaboration takes place when large enterprises interact with smaller enterprises to facilitate skills transfer. In this manner, smaller firms with limited SC capacity can pursue interactions with larger firms with requisite sustainability expertise to facilitate trickling down of sustainability skills and knowledge. Appropriate legislation can also stimulate an improved uptake of sustainability learning as has been done with health and safety (Revell, 2007). Additionally, Gleeson & Thomson (2012), call for ratification of existing sustainability policies in a practical manner to encourage increased sustainability literacy.

On formal sustainability learning, Gleeson & Thomson (2012), argue that as part of core subjects related to construction, curriculum in formal education should incorporate related sustainability concerns. This has the potential of producing graduates with appropriate skills and knowledge to improve sustainability compliance in the construction industry. Informal learning such as apprenticeship and industrial attachment are equally important. According to Gleeson & Thomson (2012), this form of learning is more suitable for those with craft and trade background in construction. This is in light of the practical involvement for the numerous construction related crafts and trades. Gleeson & Thomson (2012), postulate that trade and professional associations can help industry stakeholders overcome sustainability resource constraints through supporting acquisition of sustainability related skills and knowledge. In addition, through cooperation, these associations can act as sustainable construction knowledge hubs. The various SC literacy avenues, with their sources, are as summarised in **Table 1**.

RESEARCH METHODS

This study employed a quantitative research approach using structured questionnaires to collect sample attributes administered by the researcher with help of research assistants. For purposes of this study, key interior design stakeholders were identified as interior designers/architects, electrical engineers, mechanical engineers, quantity surveyors and contractors. This was on the basis that they are part of the basic project team in a typical professionally executed interior design project in Kenya. The target population was these key project stakeholders in the Kenyan construction industry. The sampling units were interior designers/architects, electrical engineers, mechanical engineers, quantity surveyors and contractors in Kenya.

TABLE 1: Sustainable Construction learning avenues

Sustainable Construction Learning Channels/Avenues	Source
Construction professionals' associations influence through CPDs and on degree courses	Murray & Cotgrave (2007)
Construction trade associations influence	Gleeson & Thomson (2012)
Adopting standard sustainability approaches such as BREEAM	Schweber (2013)
Formal learning (Incorporation in formal curriculum)	Murray & Cotgrave (2007) Gleeson & Thomson (2012) Higham & Thomson (2015)
Informal learning (For those with craft and trade background) such as apprenticeship and industrial attachment	Gleeson & Thomson (2012)
Legislation	Revell (2007)
Policies	Gleeson & Thomson (2012)
Collaboration amongst firms	Sommerville & McCarney (2003)

Source: Authors 2018

The sampling frame [source list] was defined as the pool of these key project stakeholders drawn from Nairobi City County, being a bigger economy compared to other counties. Additionally, the key project stakeholders were randomly picked from completed and ongoing interior design projects between the years 2016 to 2018. This ensured that they were currently and actively practicing. The choice of interior design projects was informed by the limited scholarly coverage of sustainable construction in interior design projects.

Trochim (2000), defines the unit of analysis as the major unit being analysed in a given research study and it is determined by the level at which data is analysed. For this study, the data that goes into analysis is the perspectives of key interior design project professionals in terms of frequencies. It can therefore be deduced that the individual, key professional (interior designers/architect, electrical engineer, mechanical engineer, quantity surveyor and contractor), was the unit of analysis for this study. This study targeted 60 respondents in total as the sample size computed through Yamane (1967) formula approach and adjusted for non-response as postulated by Israel (2012).

This composed of 12 interior designers/architects, 12 electrical engineers, 12 mechanical engineers, 12 quantity surveyors and 12 fit-out contractors. Out of the 60 issued questionnaires, 50 were received back, 4 were largely incompletely filled and were thus dropped and the remaining 46 found valid for analysis. This was now made up of 10 interior designers/architects, 9 electrical engineers, 9 mechanical engineers, 8 quantity surveyors and 10 fit-out contractors. This represented a 77% response rate, which is a very good response rate as postulated by Mugenda and Mugenda (2008).

The data collection instrument employed was a structured questionnaire covering definitions of key terms used to ensure uniformity in interpretation, background data of the respondents on their typical roles, years of experience, number of projects that they were handling at the time of this study and their highest levels of education and questions on sustainability literacy levels, key sustainability considerations in construction projects and sustainability literacy avenues in the Kenyan construction industry. On sustainability literacy levels and key sustainability concerns (economical, environmental and social), the respondents were asked to rate them according to their level of significance. A 5-point Likert scale was employed, with 5 being very good, 4 being good, 3 being average, 2 being low and 1 being very low. Lastly, the respondents were requested to rate the contribution of the various sustainability literacy learning avenues to their current SC literacy levels on the same 5-point Likert scale.

This study sought to ensure internal and external validity as postulated by Kothari (2004). Internal validity was ensured through critical review of the questionnaire by professionals (1 interior designers/architects, 1 electrical engineer, 1 mechanical engineer, 1 quantity surveyor and 1 fit-out contractor) drawn from the Kenyan construction industry to ensure its adequacy in addressing the research questions. Out of the resulting feedback, the main rectifications effected to the draft questionnaire included introducing a section on definition of key terms used for common understanding. Additionally, a question on number of projects being handled by the respondents was introduced to highlight their respective potential project spheres of influence. On external validity, the extent of generalization for the resulting findings was set as: to key project stakeholders as previously identified in the Kenyan construction industry on sustainability literacy as a key contributor to SC compliance.

On reliability, as postulated by Kothari (2004), the study sought to enhance the stability and equivalence aspects. Stability was achieved through collection of data with a standard span of time- before noon- to minimise the effect of external factors such as fatigue. Equivalence was realized through a standard procedure of administering the questionnaires. The researcher trained the research assistants on how to explain the purpose, intended benefits and beneficiaries of the study, including assuring the respondents of anonymity and confidentiality to enhance clarity as to the nature of the study.

Data analysis was descriptive in nature using frequencies, percentages, means and standard deviations. The resulting data was presented in form of tables and charts with a narrative to explain the findings.

RESULTS AND DISCUSSION

Respondents' Profile

Firstly, based on their typical roles in interior design projects, the composition of the 46 respondents was as illustrated in **Figure 1**. All the sub-groups of the target population were represented.

Secondly, out of the 46 valid study respondents, their experience in interior design projects was as shown in **Figure 2**.

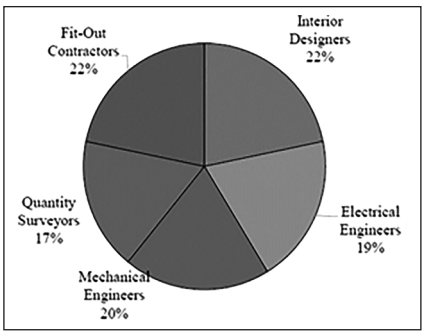

FIGURE 1
Respondents' typical role in interior design projects
Source: Field survey 2019

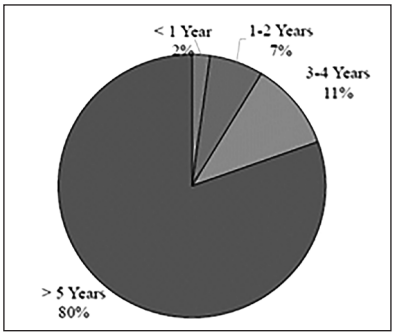

FIGURE 2
Respondents' experience in interior design projects
Source: Field survey 2019

From **Figure 2**, an overwhelming majority of the respondents had over 5 years' experience in interior design projects. This implies that they understand interior design projects and are in a position to ensure that sustainability approaches are context specific.

Additionally, as of December 2018, the number of interior design projects that the respondents were handling is illustrated in **Figure 3**. An overwhelming majority of the respondents were actively involved in 4-5 interior design projects. This implies that they had ample opportunities to ensure uptake of sustainable construction practices in their projects.

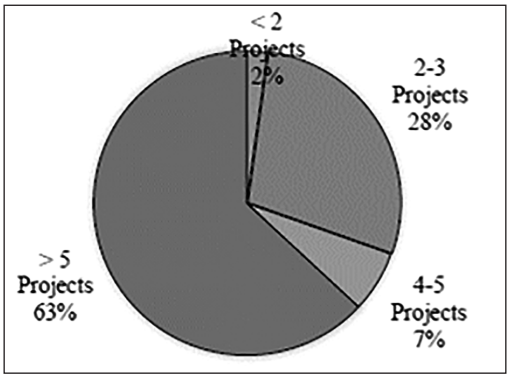

FIGURE 3
Number of interior design projects handled
Source: Field survey 2019

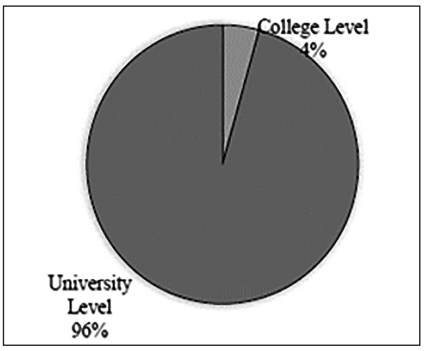

FIGURE 4
Highest level of education attained
Source: Field survey 2019

Lastly, the highest level of education achieved by the respondents was as shown in **Figure 4**. An overwhelming majority of the respondents had their highest education level as university. This implies that they are in a position to articulate and comprehend sustainable construction practices.

Respondents' Sustainability Literacy Levels

Respondents had an average (MIS=3.7102) understanding of sustainable construction practices: economic, environmental and social. Specifically, economic related construction practices scored the highest level, socially related construction practices ranked second and environmental related construction practices ranked third. This is as summarized in **Table 2**.

Respondents' Key Sustainability Considerations in Interior Design Projects

The respondents registered an average score (MIS=3.5942) as overall consideration levels of the sustainable construction benefits in interior design projects (**Table 3**). These findings were contrary to SC understanding levels which ranked the three dimensions of sustainability as economic, social and environment in decreasing order of understanding levels. This indicates a mismatch between SC literacy levels and SC considerations for the 3 dimensions of sustainability.

Impact of Sustainability Literacy Avenues on Sustainability Literacy Levels

The respondents attributed their current sustainability awareness and practice levels from

TABLE 2: Respondents' sustainability literacy levels

Sustainable Construction Learning Channels/ Avenues	Mean Item Scores (MIP)	Standard Deviation (SD)	Rank
Economic related practices such as ensuring lifecycle cost efficiency	3.7609	0.8215	1
Social related practices such as ensuring fair labor practices and access by the physically challenged	3.6957	0.8912	2
Environmental related practices such as ensuring reduction of project related emissions and minimizing waste	3.6739	1.0552	3
Grand Mean	3.7102		

Source: Field survey 2019

the various sustainable construction avenues, as a whole as an average (MIS=3.1332). Informal learning as a sustainable construction learning avenue ranked first, whereas construction trade associations influence ranked sixth. This is summarized in **Table 4**.

As shown in **Table 4**, only standard sustainability approaches, sustainability related legislation and policies and influence of construction trade associations had a mean of below 3 (average). It can thus be argued that informal learning, professional construction associations' influence, collaboration amongst firms and formal learning

TABLE 3: Respondents' key sustainability concerns in interior design projects

Sustainable Construction Learning Channels/ Avenues	Mean Item Scores (MIP)	Standard Deviation (SD)	Rank
Social related practices such as ensuring fair labor practices and access by the physically challenged	3.8043	0.9573	1
Environmental related practices such as ensuring reduction of project related emissions and minimizing waste	3.7391	0.9985	2
Economic related practices such as ensuring lifecycle cost efficiency	3.2391	1.0788	3
Grand Mean	3.5942		

Source: Field survey 2019

TABLE 4: Impact of sustainability literacy avenues on sustainability literacy levels

Sustainability Learning Avenue	Mean Item Scores (MIP)	Standard Deviation (SD)	Rank
Informal learning as apprenticeship, industrial attachment and online sources	3.9130	1.0714	1
Construction professionals' associations influence	3.4783	1.1302	2
Collaboration amongst firms	3.4783	1.2778	2
Formal learning (formal curriculum-based education)	3.2609	1.1630	3
Standard sustainability approaches such as BREEAM	2.9783	1.3248	4
Sustainability related legislation such as EMCA (1999) for environmental considerations and Employment Act (2007) for social considerations – Laws of Kenya	2.7609	1.2505	5
Sustainability related policies	2.7609	1.3197	5
Construction trade associations influence such through contractor's engagement forums	2.4348	1.1861	6
Grand Mean	3.1332		

Source: Field survey 2019

are key sustainable construction literacy avenues as postulated by Gleeson & Thomson (2012); Murray & Cotgrave (2007); Sommerville & McCarney (2003); Higham & Thomson (2015).

CONCLUSION AND RECOMMENDATIONS

The study sought to establish sustainability literacy levels in the Kenyan construction industry. From the findings, the respondents registered an average level of understanding of sustainable construction practices (economic, environmental and social). However, individually, the three sustainable construction dimensions ranked as economic, social and environmental in a descending order of understanding levels.

Secondly, the respondents' key sustainable considerations were social, environment and economic benefits in a decreasing order of consideration. This indicates a mismatch between the sustainable construction practice understanding/literacy levels and key sustainable construction considerations in interior design projects. As such, this study suggests the need to have sustainable construction literacy drives fine tuned to fit the peculiarities of the various construction industry market segments. This shall ensure that such drives are comparatively effective in informing practice.

Additionally, it was observed that the respondents attributed their current SC literacy levels mainly to informal learning, construction professional association's influence, collaboration amongst firms and formal learning. Additionally, they ranked the contribution to their current SC literacy levels, standard SC approaches, legislation, policies and construction trade associations as below average. This study thus suggests that these avenues, with specific reference to the ones that were rated as having a below average impact, be leveraged for improved sustainable construction literacy levels.

With the negative economic, environmental and social impacts of conventional construction processes and activities being very clear, there is an implied call to action to all involved stakeholders. This implied call to action is both at individual and collective levels. With up to date and industry segment specific SC skills and knowledge, the stakeholders can stimulate uptake of sustainable construction approaches in the construction industry. This is by incorporating in their respective roles economic, environmental and social impact considerations of the various processes and/or activities they are involved in.

CITED REFERENCES

Addis, B. & Talbot, R. (2001). *Sustainable construction procurement: A guide to delivering environmentally responsible projects.* London: Construction Industry Research and Information Association - CIRIA.

Adetunji, I., Price, A., Fleming, P. & Kemp, P. (2003). Sustainability and the UK construction industry - A review. *Institution of Civil Engineers, Engineering Sustainability*. 156(4), 185-199.

Baum, M. (2007). *Green building research funding: An assessment of current activity in the United States.* Retrieved November 7, 2018 from US Green Building Council Website: http://www.usgbc.org/ShowFile.aspx?DocumentID=2465.

Brundtland, G. (1987). *World commission on our common future: Report of the world commission on environment and development.* Oxford: Oxford University Press.

Bosher, L., Carrillo, P., Dainty, A., Glass, J. & Price, A. (2007). Realising and resilient and sustainable built environment: Towards a strategic agenda for the United Kingdom. *Disasters*. 31(3), 236-255.

Carboni, J., Duncan, W., Gonzalez, M., Milsom, P. & Young, M. (2018). *Sustainable project management: The GPM reference guide* (2nd ed.). United States of America: GPM Global.

Cheng, C., Pouffary, S., Svenningsen, N. & Callaway, M. (2008). *The Kyoto protocol, the clean development mechanism and the building and construction sector.* Paris, France: United Nations Environment Programme.

Construction Products Association. (2007). *Delivering sustainability: The contribution of construction products*. Construction Products Association.

Dale, A. & Newman, L. (2005). Sustainable development, education and literacy. *International Journal of Sustainability in Higher Education*. 6(4), 351-362.

Du Plessis, C. (2002). *Agenda 21 for sustainable construction in developing countries.* Pretoria: CSIR Building and Construction Technology.

Elmualim, A. & Alp, D. (2016). Perception and challenges for sustainable construction in developing countries: North Cyprus case. *Journal of Civil Engineering and Architecture.* 10, 492-500.

Gleeson, M.P. & Thomson, C.S. (2012). Investigating a suitable learning environment to advance sustainable practices among micro construction enterprises. *28th Annual ARCOM Conference, 3-5th September 2012* (pp. 1245-1255). Edinburg, UK: Association of Researchers in Construction Management.

Hayles, C. (2015). Environmentally sustainable interior design: A snapshot of current supply and demand of green, sustainable or fair trade products for interior design practice. *International Journal of Sustainable Built Environment*. 4(1), 100-108.

Higham, A. & Thomson, C. (2015). An evaluation of construction professionals sustainability literacy in North West England. In A.B. Raiden & E. Aboagye-Nimo (Eds), *31st Annual ARCOM Conference* (pp. 417-426). Lincoln: Association of Researchers in Construction Management.

Ikediashi, D.I., Ogunlana, S.O., Oladokun, M.G. & Adewuyi, T. (2013). Assessing the level of commitment and barriers to sustainable facilities management practice: A case of Nigeria. *International Journal of Sustainable Built Environment*. 1(2), 167-176.

Jones, L. (2008). *Environmentally responsible design: Green and sustainable design for interior designers* (L. Jones, Ed.). Hoboken, New Jersey: John Wiley & Sons.

Israel, G.D. (2012). Determining sample size. *PEOD6.* Florida: IFAS, University of Florida.

Joseph, S.K. (2019). *An investigation on sustainable construction compliance in the Kenyan construction industry. A perspective of interior design stakeholders in Nairobi County* (unpublished masters project). University of Nairobi, Nairobi.

Kats, G. (2003). *The cost and financial benefits of green buildings.* California: California Department of Resources Recycling and Recovery.

Keane, O. (2009). *Sustainable commercial interior design.* Ireland: Dublin Institute of Technology.

Khalfan, M., Noor, M.A., Maqsood, T., Alshanbri, N. & Sagoo, A. (2015). Perceptions towards sustainable construction amongst construction contractors in State of Victoria, Australia. *Journal of Economics, Business and Management*. 3(10), 940-947.

Kibert, C.J. (2008). *Sustainable construction: Green building design and delivery* (2nd ed.). New Jersey: John Wiley and Sons.

Kothari, C.R. (2004). *Research methodology: Methods and techniques.* New Delhi: New Age International.

Lockhart, A.S. (2016). *Paper commissioned for the Global Education Monitoring Report 2016, education for people and planet: Creating sustainable futures for all.* United Nations Educational, Scientific and Cultural Organization (UNESCO).

Macozoma, D. (2002). *Construction site waste management and minimization: International Report.* Rotterdam: International Council for Research and Innovation in Buildings.

Mugenda, A.G. & Mugenda, O.M. (2008). *Research methods: Quantitative & qualitative approaches.* Nairobi: ACTS Press.

Murray, P.E. & Cotgrave, A.J. (2007). Sustainability literacy: The future paradigm for construction education? *Structural survey.* 25(1), 7-23.

Myers, D. (2005). A review of construction companies' attitudes to sustainability. *Construction Management and Economics*. 23(8), 781-785.

Mwanza, C.K. (2013). *Professionalisation of interior design: A framework proposal for Kenya* (unpublished masters project). University of Nairobi, Nairobi.

Revell, A. (2007). The ecological modernisation of SMEs in the UK's construction industry. *Geoforum*. 38(1), 114-126.

Schweber, L. (2013). The effect of BREEAM on clients and construction professionals. *Building Research and Information.* 41(2), 129-145.

Sommerville, J. & McCarney, M. (2003). Strategic objectives of firms within a UK construction paradigm: The impact on the micro-enterprise objectives. In D. Proverbs (Ed.), *Procs of Construction and Building Research (COBRA) Conference* (pp. 16-23). University of Wolverhampton, UK: RICS Foundation.

Tam, V.Y., Tam, C.M., Zeng, S.X. & Chan, K.K. (2006). Environmental performance measurement indicators in construction. *Building and Environment.* 41(2), 164-173.

Trochim, W.M. (2000). *The research methods knowledge base* (2nd ed.). Cincinnati, OH: Atomic Dog Publishing.

UK Green Building Council. (2009). *Making the case for a code for sustainable buildings.* Retrieved August 4, 2018 from http://www.ukgbc.org/site/resources/show-resource-details?id=405.

UNDP. (2012). *Sustainable development in Kenya: Stocktaking in the run up to Rio+20.* Nairobi: UNDP.

UNDP. (2017). *Sustainable development goals (SDG's).* Retrieved September 7, 2017 from www.unpdp.org/content/undp/en/home/sustainable-development-goals.html.

Usal, S.S.Y. (2012). Evaluation of product consumption undertakings of interior architecture students in terms of sustainability. *Procedia- Social Behavioral Sciences*. 47, 351-356.

Yamane, T. (1967). *Statistics: An introductory analysis.* New York: Harper and Row.