VOL. 14, NO. 13, JULY 2019 ISSN 1819-6608
ARPN Journal of Engineering and Applied Sciences

www.arpnjournals.com

ANALYSIS THE STUMBLING BLOCKS ASSOCIATED WITH SUSTAINABLE PROCUREMENT IN INDUSTRIAL CONTRACTING USING 5-WHYS TECHNIQUE

Ryad Tuma Hazem[1] and Hatem Khaleefah Breesam[2]
[1]Civil Department, Engineering College, Baghdad, Iraq
[2]Engineering College, Baghdad, Iraq
E-Mail: ryadtuma@gmail.com

ABSTRACT

The construction industry is one of the important economical source for many developing countries to further focus on this industry, contracting parties need to adhere to sustainability standards and towards the development of regulations related to the establishment of a sustainable in contracting industry. Considering that Iraq is one of the developing countries so that influential members in the construction industry as a part of contracting industry to adhere to the standards of sustainability in all sections, especially the part of related with procurement. This study is condensed the steps on describing of stumbling blocks and analysis root causes associated with sustainable procurement process then highlighting the reasons for delaying the sustainable application for procurement issues in construction activities related with oil industrial sector. The applying of 5-why methodology and series to find out the real causes and specify the treatments based on applying the survey for experts, consultant and engineers whom have wide experiences in construction spectrum. Access to outputs in each construction phases that contributes to the application of sustainable conditions in processes that are an important part of communication among the contractual parties therefor; the outputs of contracting and sustainable procurement will contribute to imposing restrictions on contractors, subcontractors, suppliers to compel them to commit on applying sustainable standards in the construction process.

Keywords: construction projects, stumbling blocks, 5-why, sustainable procurement.

1. INTRODUCTION

Iraq is one of the developing countries that aspire to overcome many obstacles and challenges to the application of the concepts of sustainability in industries, especially in the construction sectors, which supports the oil industry in Iraq. The degree of emphasis on changes into implementation of sustainable aspects in any parts of general industries spatially in procurements in so many developing countries dose not reach to high positive level section of procurement to reflect more attention from participators in this part in each industry. There are many reasons for this disparity due to the lack of consideration of the importance of changes in the environment and climate and the importance of the optimal use of vital sources. “The procurement process is viewed as involving sourcing (planning: needs identification and assessment, supplier selection) contracting, monitoring and evaluation, and expediting” (Kalubanga 2012). Based on (Baloi 2003; Illankoon, Tam, & Le 2016had mentioned that the construction industry and its outcomes have a serious impact on the environment and social well-being. The contractual parties have to spend more efforts to minimizing the impact of construction process on environment and community around them especially in oilfield camps. This paper is focused on how to achieve sustainability procurement concepts in the construction sector which related in the field of oil industrial in Iraq and the second part of this study on how to find root-cause effects and valuable treatment by using 5-why technique that all depend on all feedbacks form experts.

1.1 Motivation of research study

The following point refers to the enough reasons to create great level of motivation to work on this kid of research paper:

- In order to understanding the root causes that prevent the application of sustainable conditions in procurement and contracting process.
- The guarantee of the application of green methodology in construction projects that require to predict the risks of barriers to identification of root causes and then adopting treatments for minimizing its impact in order to credit the project highly on sustainable development channels.
- Very supportive for decision-making that helps to ration resources and optimize their utilization to reach real sustainable applications in the procurements which associated with (construction as part work in oilfield camps) industries process.
- Promote the application of sustainable methodology in the procurements methods of selecting contractors, secondary contractors and suppliers on the basis of their calculation scores of tenders and awarded the contract to bidder whom have high thinking about in the importance of the application of sustainability in whole process.

2. METHODOLOGY OF STUDY

The following main steps are giving full idea about the applied procedures in study:

- Scoping of theoretical concepts & highlight the process of sustainable procurement
- Surveying of previous studies which related with topic of study and its objectives.
- Re-Framing of stumbling blocks associated with sustainable procurement process.
- Using questionnaire technique to rank the stumbling blocks based on their weights.
- Employing of 5-why technique and listing of the important required treatment for the identified stumbling blocks to support the changes towards a sustainable approach in procurements.
- Conclusions of paper research

3. SCOPING OF THEORETICAL CONCEPTS FROM PREVIOUS STUDIES

Procurement can be defined as "the process of acquiring goods, works and services, covering both acquisitions from third parties and from in-house providers" (Sourani 2008)". The concept of sustainability is one of the practical concepts associated with products and construction processes. Due to the project's life cycle, each stage of the project life cycle must be linked to the concept of sustainability. The stage of contracting and procurement of the essential stages for any project life span to ensure that all project phases should match completely with sustainable concepts that need a lot of efforts form contractual parties. To ensure access to the overall values of sustainability it needs to adapt both the internal and external conditions of organization. For achieving the summit in sustainable during project's life cycle that required for overcoming a set of stumbling blocks associated with contracting and procurement processes. When applying sustainability in any part of any industries to be developed in the same time the decision-makers have to hand the reducing their environmental and societal impacts it is necessary to identify and identify the constraints inherently associated with the process of transition from traditional procurement to sustainable procurement. "several studies have referenced that there are various matter and obstacles related to the application of sustainable public procurement. These various matter and obstacles that make an impact on the implementation of sustainable public procurement in one country might be different in another probably due to socioeconomic, demographic and cultural differences Adham & Siwar (2012).

4. DEALING WITH CONCEPTS OF SUSTAINABLE PROCUREMENT

Based on the global trend, which aims to create a sound environment free from the negative effects which making high impact on human beings and nature by finding optimal solutions for upgrading the supporting processes in any level of its industry, including the process of transformation towards sustainable procurement. That is very important for the construction industry to move towards sustainable (Illankoon, Tam, & Le 2016). "Sustainable procurement builds on the traditional procurement practice which seeks to extend through the adoption of sustainability principles (Kalubanga 2012)". During involving of purchases at each stage of the project or in other words in each project life cycle steps that need well planning, organizing and operation to match with integrated sustainable concepts. Based on that there are many researchers have specified procurement as a prime mechanism to meet with sustainability actions Ruparathna, R., & Hewage, K. (2015b).

5. HIGHLIGHTING OF STUMBLING BLOCKS

A grouping the actions is required for reaching out to a stumbling blocks by several direct beneficiaries form the outputs of sustainable procurement process which started from manufacturer, transporters, venders/supplier and end -users all of those need to work under governmental regulations. Those regulations supposed to support sustainable aspects. Therefore, the following several previous studies are deal with some aspects related with topic. The aspects are differentiated from level of impacts on application of sustainability strategies in procurements such as he lack of sufficient time to address sustainability issues, the importance of training, lack of communication and coordination both within the organization and between suppliers and clients, lack of management support, lack of the definition of clear goals, resistance to revision or may lack in aspect of implementation all required sustainable practices in procurement process (Varnäs, Balfors & Faith-ell 2009; Sourani & Sohail 2011; Swanson *et al*. 2005;Testa *et al.* 2016; Iles & Ryall 2016).".." During the study of "Carter and Fortune (2007)" mentioned that there is a lack of structured frameworks to support the project teams in delivering sustainable construction projects. "Korkmaz (2012) "emphasized on the importance of having qualified professionals who thoroughly understand sustainable buildings and project delivery processes to implement sustainable procurement (Ruparathna & Hewage 2015b). "financial issues are possibly one of the main barriers for sustainable procurement worldwide (Varnäs 2008; Brammer & Walker 2011). "availability of funding is important to deliver sustainable procurement; the literature denoted that cost is the leading barrier to sustainable procurement (Sourani & Sohail 2011; Sourani & Sohail 2013; Walker & Brammer 2009).".

5.1 Re-framing of stumbling blocks

To identify the stumbling blocks associate with sustainable procurement in construction industrials that done according to the previous studies and discussion with experts during the interviews and site visits of the several projects locations. Therefore, factors such as high costs and poor organizational structure of the enterprise, luck of regulations, commitment of contractual parties in applying sustainable concepts, lack of integration between all system in organization and non-using the smart technology, lack of selection supplier based on sustainable criterions, lack of competition may accrued in the local markets, lack of Green Practitioners in marketing process and other stumbling blocks. All of those stumbling blocks

and other re-framing them in survey process to be cover this area of research.

6. ANALYSIS OF THE QUESTIONNAIRE

To development of a specific methodology must take into account the opinions and ideas of specialists and experts. The questionnaire has been prepared and designed to be easy for understating and dealt with targeted groups. The applying of closed questionnaires techniques in first part of this study to determine which ones from specific several (stumbling blocks) are most likely to be impact on sustainable procurements and contracting process. The second part of this study to reach to root causes of ranked stumbling blocks by using five-whys method then put the important treatments to overcome of those stumbling blocks.

6.1 Scoping of the questionnaire

The questionnaire was distributed to a group of experts, specialist' sengineers working in the industrials (construction associated in oilfield), and other supported field in Iraq.

6.1.1 Pattern of the responding the questionnaire

From total 83 forms of questionnaire was distributed by personal interview and collecting them by hand-submitted also E-mail. The 76 collected forms was correct of responding level. The following figure shows responding of questionnaire from the participants.

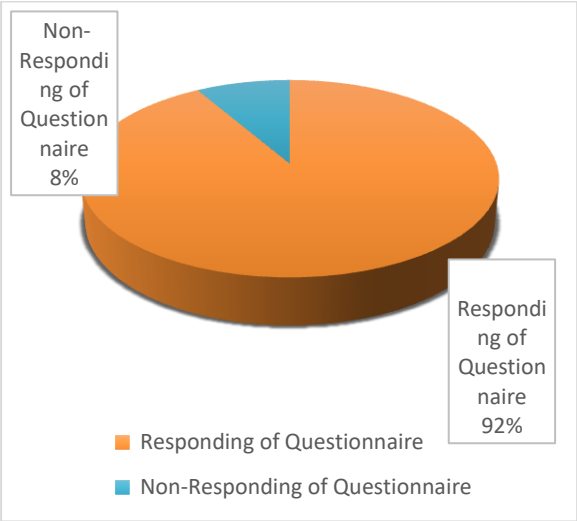

Figure-1. Pattern of responding of questionnaire from the participants.

The 76 collected forms of questionnaire are divided into four group (owners/General contractors/Subcontractor and Consultants-Academics) were targeted survey. As shown in the Table-1.

Table-1. Details of specialization of participants.

BUSINESS ORIENTATIONS	SPECIALIZATION SUBJECT					TOTAL
	Environment and Energy	Civil	Architecture	Electrical Engg.	Mechanical Engg.	
Owners	7	11	2	2	3	25
General contractors	3	5	1	1	2	12
Subcontractors	1	3	0	1	1	6
Consultant& Academic	6	14	4	4	5	33

6.1.2 Experienced years

The experienced years are shown in Table-2 which display exactly the numbers of experienced years of the participants in their field of their works:

Table-2. Experienced Years of participants.

No.	Scope	Percentage
1	16-20	17.3
2	21-25	24.7
3	26-30	28.2
4	More than 30	29.8

6.2 Trends of validity and reliability

In this part of the study, it demonstrates the importance of consistency, validity, reliability to ensure the all data on line of consistency and correlation.

6.2.1 The trends of validity

The purpose of the validity's measurement is to be most reasonable and passable therefore, it can be scoped to the following levels which applied to exam its report. To test validity contents by examining the content, consistency and suitability of the questionnaires in survey process. To test level of internal content and structural of validity via test of significant level (Sig.). As in next Table-3 reflect that matching degree of each one to all targeted items in high attention of them and not only to one of them.

Table-3. Organizational level consistency.

Coding.	The oriented Topic	Internally (level of Sig..	Organizationallycons istency (level of Significance ≤0,05).
SB-P	Stumbling blocks associated with Procurement	0,01	Matching and Satisfy

6.2.2 The trends of reliability

To maintain the level of reliability and benefit-making the research need to conduct the following statistical applications to achieve the desired objectivity and to reach to indexation of the logical sequence of the questionnaire procedures.

Coding.	The oriented Topic
SB-P	Stumbling blocks associated with Procurement (to all items)

Ranging of "Corr. Coffi" (0.470 to

Significance level (0,01) satisfy to all items

6.2.3 Cronbach's Alpha for stumbling blocks items

By adopting of Cronbch's Alpha for checking and reaching to valuable level of reliability of data. By employing of one of well-known statistical software that is Statistical Product and Solutions Services (SPSS) under version of (25) to find out (α) value via the formula:

$$(\alpha) = \frac{N.\bar{C}}{(\bar{V}+(N-1).\bar{C})}$$

(α) =

Where;

N : The number of items,
$\bar{C}$: Average covariance between item-pairs,
$\bar{V}$: Average variances,

The Cronbach's values stated in the next table.

No	Filed of the study	No. of items	Cronbach's Alpha
1	Stumbling Blocks (SB) associated with Procurement processes:	18	0.832

Cronbach's Alpha for total 18 items= 0.90

Through the previous results, the reference was clear on the objectivity, degree of consistency and organization, which correspond to the views of experts at the stage of preparation of the questionnaire. The questionnaire has been prepared in a way that achieves the research objectives of this paper.

6.2.4 Orderliness of stumbling blocks:

For the purpose of calibration, optimization and the effective range of understanding the stumbling blocks from participants on sustainable procurement applications, a scale of lekert is required to identify and used in range from (1, 2, 3, 4, and 5). read and understand well by the experts participating in the questionnaire.

For gradation and reaching to the ranking of the identified stumbling blocks in two separate groups (procurement process) that need to analysis all in one core. While the validity core is required in this study and it is very close to excellent level in process. Evaluation of the level of response from the participants as mentioned that the logical scale was adopted to be more clearly related to the different responses. This measure is (Lekert Scale). Building of a five scale in the base as in the following table:

Table-4. Scale of measurement responses.

Level of Response	Numerical equivalent scale
Not applicable on it	1
Does not affect it	2
Somewhat affects it	3
Directly affects it	4
Strongly affects on it	5

6.3 Data analysis

After the collected all required data from participant groups the analysis of those collected data by adopting (Std Deviation, Mean) to weight all stumbling blocks by using SPSS version 25.

6.3.1 Mean measurement: is used for weighing and then ranking method of data collection by adopting the following formula following formula (Siegel and Casteellan, 2008):

$$Ms=\sum_{K=0}^{n} (X1*S1+ X2*S2+ X3*S3+\ldots X_n * S_n)/N$$

Where,
Ms = mean Score ($1 \leq MS \leq 5$).

6.3.2 Standard deviation method

For measuring Std. Deviations for each data collected form participants to find out the variation between those data. and it used according to the equation (Bluman, 2012):

$$S=\sqrt{\sum_{K=0}^{n} (X_i-X)^2*f_i/ (\sum_{K=0}^{n} f_i)}$$

Where:
S = standard deviation,
x = mean scores,
xi = degree of the criterions importance,
fi = frequency level of each.

The table ( ) shows weighs of each stumbling blocks associated with sustainable procurement process by adopting the calculation of Std deviation and Means.

Table-5. Std devition and Mean of sumbling blocks.

Coding SB-P	Stumbling Blocks	Std. Deviation	Mean (Ms)
SB-P1	Weakness of commitments of suppliers, subcontractors, venders about practicing of sustainable aspects	.96564	4.3816
SB-P2	Obstacles related with High costs	.97369	4.3421
SB-P3	Lack of training about the sustainable practices	1.40893	3.5395
SB-P4	Lack of Integration of IT system	1.28275	3.6447
SB-P5	Poor Organizational Structure	1.42681	3.1316
SB-P6	Lack of Green Practitioners in marketing process	1.49971	3.2200
SB-P7	Lack of Regulations in construction process	1.30988	3.1450
SB-P8	Lack of Competition	1.44192	2.8816
SB-P9	Customers' unawareness of sustainable green materials and products	1.10715	3.8816
SB-P10	Absence of motivation policies about construction procurement process	1.07955	3.6447
SB-P11	Lack of governmental monitoring and laws	1.55524	3.3553
SB-P12	Not Available sustainable criteria for selection, evaluation of suppliers/ vendors	1.04663	4.3947
SB-P13	Weak of communication between relevant departments about environmental issues	1.39397	3.2368
SB-P14	Financial constraints associated with sustainable procurement	1.41737	3.5658
SB-P15	Un-availability and quality of procurement data in construction projects	1.11229	3.5526
SB-P16	barriers of Social and environmental considerations	.98006	4.3026
SB-P17	Un-adopting of sustainable credentials of goods/services	1.24893	3.0132
SB-P18	Un-availability of Clear legislation on green procurement in construction and oil industry	1.59429	3.2105

Ranking of Stumbling Blocks: According to the previous weights of each one of stumbling blocks the researcher re-arrange the stumbling blocks orderly under column of ranking.

Table-6. Ranking of Stumbling blocks associated with sustiabable procurement.

Coding SB-P	Stumbling Blocks	Std. Deviation	Mean	Ranking
SB-P12	Not Available sustainable criteria for selection, evaluation of suppliers/ vendors	1.04663	4.3947	1
SB-P1	Weakness of commitments of suppliers, subcontractors, venders about practicing of sustainable aspects	.96564	4. 3816	2
SB-P2	Obstacles related with High costs	.97369	4.3421	3
SB-P16	Barriers of Social and environmental considerations	.98006	4.3026	4

7. FIVE-WHYS TECHNIQUE

For highlighting the root causes of delays in the implementation of sustainable procurement process in construction projects and using of five-whys method for development of preventive solutions and treatments required by a group of experts. According definition of root cause Chung and Kotsis ،(2012): “Root cause analysis is an approach to identifying the root cause or causes of a problem (instead of the symptoms) in the process or structure of an organization and determining prevention strategies”. Based on Rooney J, Vanden Heuvel L. (2004): Root causes are those over which management has control and those for which effective recommendations can be generated. In this section of paper refers to "series of whys" and all the causes are associated with the identified stumbling blocks sequentially until for obtaining to the root cause/s and then for finding out and formulating possible treatments.

Table-7. Steps of five-why to identify root causes associated with sustainable procurement process.

No	Stumbling Blocks associated sustainable Procurement Process	Series of (Why?)	Root Causes
1	Not Available sustainable criteria for selection, evaluation of suppliers/ vendors	Weak of client's commitments to overall sustainability criterions (why? ❷)	Un- adoption of sustainable criteria in the selection and evaluation for suppliers and venders via oil departments and oilfield
		weakness in tendering procedures and selection of supplier and vendors (Why? ❸)	
		Lack of true desire from clients and their team to apply sustainable criterions (why? ❹)	
		Weakness in the efficiency of employees in contracting & procurement departments (why?❺)	
2	Weakness of commitments of suppliers, subcontractors, venders about practicing of sustainable aspects	lack of long - term strategy (why? ❷)	Weak analysis of costs in sustainable projects and lack of understanding of their long-term effects on the project.
		Weakness of client and top Management (Why? ❸)	
		weakness in documentation procedures for all contractual parties (why? ❹)	
		Absence of obligation in Monitoring and evaluation process (why?❺)	
3	Obstacles related with High costs	weakness of financial analysis (why? ❷)	Weak analysis of costs in sustainable projects and lack of understanding of their long-term effects on the project.
		weakness of management to provide the required resources (Why? ❸)	
		insufficient of information about all activities/tasks related with sustainable (why? ❹)	
		absence of long term assessment for real cost during the project life cycle (why?❺)	
4	Barriers of Social and environmental considerations	Lack of clear environmental and social legislations (why? ❷)	Weakness in the analysis of environmental and social impacts to access to valuable outcomes of environmental and social justice is associated with sustainable projects
		insufficient awareness of the importance of sustainable projects and their positive impacts on the communities (Why? ❸)	
		Weak legislation encourages green products (why? ❹)	
		Weakness in (reduce, reuse, recycle and recovery) procedures on construction materials and productions (why?❺)	

By using 5-whys method to show the level of weakness in understanding effects of costs and not only for short-term effects but, the contractual parties should be understanding very-well the impact of costs and the benefits in 360 degrees for (medium- and long-term) when they will ready to implements all sustainable aspects in construction process widely.

7.1 Listing out of the treatments

After finding root causes through 5-whys technique the current section of research is focused on the listing out the treatments which collected from experts in both construction field and oilfields. By adopting the preparation and designed form for combining of experts' feedbacks and treatments. The following tables show how the experts' recommended significant treatments by adopting five-why steps.

Table-8. For Treatment.

No.	Stumbling blocks associated sustainable Procurement Process	Treatments
1	Not Available sustainable criteria for selection, evaluation of suppliers/ vendors	1) Commitments of clients by adopting sustainable criterions for selection of suppliers and venders
		2) The desire to change the traditional evaluation rules for contractors at the Ministry of Planning and relevant ministries.
		3) The development of medium and long term work methodology to make sure apply sustainable criterion in the process of selection and evaluation suppliers and venders
		4) Create network for development processes and use electronic purchases requests (e-PR system) to increasing transparency level in procurement.
2	Weakness of commitments of suppliers, subcontractors, venders about practicing of sustainable aspects	1) Compliance of client with green procurement laws and instructions.
		2) Imposition of contractual procedures to suppliers, subcontractors, venders to increasing level of commitments in sustainable procurements bases
		3) The use of appropriate methods the forms of sustainability in reliance on smart technology in energy, management of water resources, recycling of materials and reduce the use of harmful substances on the environment and exhausting economy when installation the required system such as Heating, ventilation, and air conditioning (HVAC) and lighting...etc.
		4) Effective communication between the public and private sectors to exchange knowledge on all procurement-related sustainability applications to increase commitment and contribution to raising awareness among competitors in the local market in accordance with the principles of sustainable economy
3	Obstacles related with High costs	1) Activation of costing optimization to cover all process and project life cycle from (conceptual phase till operation and maintenance phases) to aware completely the impacts of the costs for long-term.
		2) Develop a long-term cash flow monitoring program during the project life cycle
		3) Relying on professional consulting and design firms to set up cost efficiency management system to screen: a.initial costs (purchasing), b. O&M costs, recovery cost, disposables cost to meet with vision and mission of the project and organization itself.
		4) Activation of costing optimization to cover all process and project life cycle from (conceptual phase till operation and maintenance phases) to aware completely the impacts of the costs for long-term.
4	Barriers of Social and environmental considerations	1) Employing of creative ideas and innovation designed to overcome those barriers
		2) Adopt sustainable approaches for whole project resources throughout the life of the project (from conceptual phase until operations, maintenance and demolition)
		3) Increasing of public awareness is to include all contractual parties, community beneficiaries about the long-term impacts using of sustainable methodologies.
		4) Utilization of the required actions to present potential impacts on (earth resources, air quality, water resources and its quality, historic Cultural & archaeological resources, Biological Resources) and rise those actions to top management to support their decisions.

8. CONCLUSIONS

This study stated the extent to which these stumbling blocks are linked to the negative impact on sustainable procurement procedures and hinder the development of companies operating in the industrial contracting sector which covering both operations in construction and oil industrial. The existence of stumbling blocks such as not available selection criterions for supplier and how to evaluate them based on sustainable trends, weakness of commitments, negative thinking about high costs, failure to observe regulations and legislations Social and environmental issues and availability of the sets of treatments to those specified stumbling blocks will be part of ingenuity and future solutions to ensure a sustainable shift in procurement. The commitment of the contractual parties is one of the importance tool to ensure the adhering the all procedures of procurement is move on line of the principles of sustainability for the purpose of reaching an industrial market that encourages this transformation. Also, the research paper notes that Iraq as a developing country needs a lot of efforts in the field of legislation, application and basic understanding of the practical aspects of sustainability and adopted the concept of integration in industries as in the importance of the construction industry in the oil industry. Therefore, the legislations issued which adopt the concepts of contracting and procurement under a sustainable basis should encourage industrial integration and integration in sustainable operations to benefit from resources, reduce environmental impacts, maximize economic benefits and reflect the importance of this integration to social life. additional conclusion from this paper that sustainable

procurement requires high commitment and concerted efforts by government and the private sector to ensure that all obstacles are overcome to achieve sustainability applications in the industrial, construction, oil and other industries in Iraq.

REFERENCES

[1] Ageron B., Gunasekaran A., Spalanzani A. 2012. Sustainable supply management: an empirical study. Int. J Production Econ. 140: 168-182.

[2] Abidin, N. Z. 2010. Investigating the awareness and application of sustainable construction concept by Malaysian developers. Habitat International. 34(4): 421-426.

[3] Adham N. K. & Siwar C. 2012. Empirical Investigation of Government Green Procurement (GGP) Practices in Malaysia. OIDA International Journal of Sustainable Development. 05(08): 41-50. Retrieved from http://www.ssrn.com/link/OIDA-Intl-Journal-SustainableDev.htm

[4] Brammer S. & Walker H. 2011. Sustainable procurement in the public sector : an international comparative study. International Journal of Operations & Production Management. 31(4): 452-476. http://doi.org/10.1108/01443571111119551.

[5] Boomsma M. J. 2009. Sustainable procurement from developing countries: practices and challenges for businesses and support agencies. In: Boomsma M, Mangnus E, editors. Bulletin 385. Amsterdam: KIT Publishers.

[6] Brammer S. & Walker H. 2011. Sustainable procurement in the public sector : an international comparative study. International Journal of Operations & Production Management. 31(4): 452-476. http://doi.org/10.1108/01443571111119551

[7] Blair F, Wrigh D. 2012. Implementing sustainable procurement. In: European Pathway to Zero Waste & Resources Action Programme (EPOW). Oxfordshire: European Pathway to Zero Waste, Waste & Resources Action Programme.

[8] Blair F., Wrigh D. 2012. Implementing sustainable procurement. In: European Pathway to Zero Waste & Resources Action Programme (EPOW). Oxfordshire: European Pathway to Zero Waste, Waste & Resources Action Programme.

[9] Barney J. 1986. Organizational culture: can it be a source of sustained competitive advantage? Academy of Management Review. 11, 656-65.

[10] Chaharbaghi K. & Lynch R. 1999. Sustainable competitive advantage: towards a dynamic resource-based strategy. Management Decision. 37(1): 45-50. http://dx.doi.org/10.1108/00251749910252012.

[11] Carter K & Fortune C. 2007. Sustainable development policy perceptions and practice in the UK social housing sector. Construction Management and Economics. 25(4): 399-408.

[12] Du Plessis C. 2002. Agenda 21 for sustainable construction in developing countries. CSIR Report BOU E, 204.

[13] Damanpour F. 1991. Organizational innovation: A meta-analysis of effects of determinants and moderators. The Academy of Management Journal. 34(3): 555-590. http://dx.doi.org/10.2307/256406.

[14] Dania A. A., Larsen G. D. & Yao R. 2013. SUSTAINABLE CONSTRUCTION IN NIGERIA: UNDERSTANDING FIRM LEVEL PERSPECTIVES. Paper presented at the Sustainable Building Conference Coventry University.

[15] Dania Kehinde, J. & Bala K. 2007. A study of construction material waste management practices by construction firms in Nigeria. Building Research Reports series, Caledonia University, Scotland UK. pp. 121-129.

[16] Ebohon O. J. & Rwelamila P. 2001. Sustainable construction in Sub-Saharan Africa: relevance, rhetoric, and the reality. Agenda. 21, 16.

[17] Emmanuel A.-J., Ibrahim A. D. & Adogbo K. J. 2014. An assessment of professionals' perception of the sustainability performance of infrastructure projects in Nigeria. Journal of Construction Project Management and Innovation: Supplement 1, 4, 912-932.

[18] Gan X., Zuo J., Ye K., Skitmore M. & Xiong B. 2015. Why sustainable construction? Why not? An owner's perspective. Habitat International, 47, 61-68.

[19] Genovese A., Koh S. C. L., Bruno G., Esposito E. 2013. Greener supplier selection: state of the art and some empirical evidence. Int J Production Res. 51: 2868-2886.

[20] Hasselbalch J., Costa N., Blecken A. 2012. Investigating the barriers to sustainable procurement in the United Nations. In: United Nations Office for Project Services, editor. Balancing social, environmental and economic considerations in procurement. UN. pp. 18-23.

[21] Hill R. C. & Bowen P. A. 1997. Sustainable construction: principles and a framework for attainment. Construction Management & Economics. 15(3): 223-239.

[22] Illankoon I., Tam V. & Le K. 2016. Environmental, Economic and Social Parameters in International Green Building Rating Tools. Journal of Professional Issues in Engineering Education and Practice. 1-8. http://doi.org/10.1061/(ASCE)EI.1943-5541.0000313.

[23] Iles D. & Ryall P. 2016. How can the United Kingdom construction industry implement sustainable procurement strategies? Proceedings of the 32nd Annual ARCOM Conference, ARCOM 2016, 2(September), 1121-1130.

[24] Jailani J., Reed R. & James K. 2015. Examining the perception of tenants in sustainable office buildings. Property Management. 33(4): 386-404.

[25] Kalubanga M. 2012. SUSTAINABLE PROCUREMENT: Concept, and Practical Implications for the Procurement Process. International Journal of Economics and Management Sciences. 1(7): 01-07.

[26] Konsynski B., Bray D. A. & Thomas, D. 2007. IS-Driven Organizational Responsiveness. Retrieved from http://ssrn.com/abstract=984598.

[27] Korkmaz S. 2012. Case-Based and Collaborative-Learning Techniques to Teach Delivery of Sustainable Buildings. Journal of Professional Issues in Engineering Education and Practice, ASCE. 138(2): 139-144. doi: 10.1061/(ASCE)EI.1943-5541.0000090.

[28] Kevin Chung, Sandra V. Kotsis. 2012. Complications in surgery: root cause analysis and preventive measures. Published in Plastic and reconstructive surgery 2012. DOI:10.1097/PRS.0b013e31824ecda0

[29] Laura Montalbán1; Pablo Ballesteros-Pérez2; Amalia Sanz1; Eugenio Pellicer. 2017. Sustainable Public Procurement: barriers and drawbacks. 21th International Congress on Project Management and Engineering.

[30] Mathiyazhagan K., Govindan K., Noorul Haq A., Geng Y. 2013. An ISM approach for the barrier analysis in implementing green supply chain management. J Clean Prod. 47: 283-297.

[31] Md Mazharul Islam, Md Wahid Murad, Adela J. McMurray & Turki S. Abalala. 2016. Aspects of sustainable procurement practices by public and private organisations in Saudi Arabia: an empirical study. International Journal of Sustainable Development & World, Ecology, DOI:10.1080/13504509.2016.1209794 to link to this article: http://dx.doi.org/10.1080/13504509.2016.1209794.

[32] Morgan R. M. & Hunt S. D. 1994. The Commitment-Trust Theory of Relationship Marketing. Journal of Marketing. 58(July), 20-38. http://dx.doi.org/10.2307/1252308.

[33] Montgomery C. A. & Porter M. E. 2009. Strategy: Seeking and Securing Competitive Advantage. The Harvard Business Review, Boston, M. A.

[34] Naoum S. G. & 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. http://doi.org/10.1108/IJMPB-09-2015-0094

[35] Nwokoro I. & Onukwube H. 2015. Understanding green and sustainable construction in Lagos, Nigeria: Principles, attributes and framework. Ethiopian Journal of Environmental Studies and Management. 8(1): 57-68.

[36] O.E. Ogunmakinde, W. D. Sher, K. Maund. 2016. OBSTACLES TO SUSTAINABLE CONSTRUCTION IN DEVELOPING COUNTRIES…, Conference Paper, 2016 Conference: Australasian Universities Building Education Association (AUBEA) Conference 2016, At Pullman Cairns International, Cairns, Queensland, Australia. Vol. 40.

[37] Oko John A. & Emmanuel Itodo D. 2013. Professionals' views of material wastage on construction sites and cost overruns. Organization, Technology & Management in Construction: An International Journal. 5(1): 747-757.

[38] Peattie K. 2001. Towards sustainability: The third age of green marketing. Marketing Review. 2, 129-146. doi:10.1362/1469347012569869

[39] Peattie K. & Crane A. 2005. Green marketing: Legend, myth, farce or prophesy? Qualitative Market Research: An International Journal. 8(4): 357-370. doi:10.1108/13522750510619733

[40] Porter M. & van der Linde C. 1995. Green and competitive: Ending the stalemate. Harvard Business Review. 73(5): 120-133.

[41] Pitt M., Tucker M., Riley M. & Longden J. 2009. Towards sustainable construction: promotion and best practices. Construction innovation. 9(2): 201-224.

[42] Ruparathna R. & Hewage K. 2015b. Sustainable procurement in the Canadian construction industry : current practices, drivers and opportunities. Journal of Cleaner Production. 109, 305-314. http://doi.org/10.1016/j.jclepro.2015.07.007.

[43] Ruparathna R. & Hewage K. 2015b. Sustainable procurement in the Canadian construction industry : current practices, drivers and opportunities. Journal of Cleaner Production. 109, 305-314. http://doi.org/10.1016/j.jclepro.2015.07.007.

[44] Rooney J. and L. Vanden Heuvel. 2004. Root Cause Analysis for Beginners. Quality Progress. 37(7): 45-53.

[45] Sourani A. & Sohail M. 2011. Barriers to addressing sustainable construction in public procurement strategies. Engineering Sustainability. ES4(2010): 229-237. http://doi.org/http://dx.doi.org/10.1680/ensu.2011.164.4.229.

[46] Sourani A. 2008. Realising sustainable construction through procurement stratergies. Loughborough University.

[47] Shafii F., Arman Ali Z. & Othman M. Z. 2006. Achieving sustainable construction in the developing countries of Southeast Asia.

[48] Sourani A. & Sohail M. 2013. Enabling sustainable construction in UK public procurement. Proceedings of Institution of Civil Engineers: Management, Procurement and Law. 166(6): 297-312.

[49] Siegel and Casteellan. 2008. Nonparametric Statistics for the Behavioral Sciences.

[50] Shen L.-y., Tam V. W., Tam L. & Ji Y.-b. 2010. Project feasibility study: the key to successful implementation of sustainable and socially responsible construction management practice. Journal of Cleaner Production. 18(3): 254-259.

[51] Swanson M., Weissman A., Davis G., Socolof M.L. & Davis K. 2005. Developing priorities for greener state government purchasing: a California case study. Journal of Cleaner Production. 13(7): 669-77.

[52] Testa F., Annunziata E., Iraldo F. & Frey M. 2016. Drawbacks and opportunities of green public procurement : an effective tool for sustainable production. Journal of Cleaner Production. 112, 1893-1900. http://doi.org/10.1016/j.jclepro.2014.09.092.

[53] Testa F., Grappio P., Gusmerotti N. M., Iraldo F. & Frey M. 2016. Examining green public procurement using content analysis : existing difficulties for procurers and useful recommendations. Environment, Development and Sustainability. 18, 197-219. http://doi.org/10.1007/s10668-015-9634-1

[54] Varnäs A. 2008. Enhancing Environmental Performance by Green Procurement: A study of environmental procurement preferences in the construction industrial. Stockholm, Sweden.

[55] Varnäs A., Balfors B. & Faith-ell C. 2009. Environmental consideration in procurement of construction contracts : current practice, problems and opportunities in green procurement in the Swedish construction industry. Journal of Cleaner Production. 17, 1214-1222. http://doi.org/10.1016/j.jclepro.2009.04.001

[56] Walker H., Brammer S. 2009. Sustainable procurement in the United Kingdom public sector. Supply Chain Manage Int J. 14: 128-137.

[57] Wong E. O. & Yip R. C. 2004. Promoting sustainable construction waste management in Hong Kong. Construction Management and Economics. 22(6): 563-566.

[58] Walker H. & Brammer S. 2009. Sustainable procurement in the United Kingdom public sector. Supply Chain Management: An International Journal. 14(2): 128-137. http://doi.org/10.110