INFLUENCE OF GLOBAL SOURCING ON PROCUREMENT PERFORMANCE OF MEGA PROJECTS IN THE ENERGY SECTOR IN KENYA

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Abstract

Governments around the world face a rising demand for infrastructure. Most governments, including Kenya, are attempting mega projects to bridge the infrastructural gap. Kenya has prioritized, under the Kenya Vision 2030, a number of Mega projects. However most mega projects have, (or are), experienced procurement related challenges, which threaten their efficient implementation thereby threatening achievement the Vision 2030 aimed at transforming Kenya into a middle income Nation. The energy sector, a critical support sector of the Vision 2030 pillars, plans to increase power production by 10,000Mw by the year 2030, from the current estimated production of slightly above 2000Mw, through an array of mega projects. This study set out to examine the influence of global sourcing on the procurement performance of Mega projects in the energy sector in Kenya. The study entailed a census of all the 47 mega

projects under the various public procuring entities in the energy sector. The unit of observation was the procurement managers in the procuring entities dealing with mega projects. Objectively developed questionnaires were used to collect primary data. The data collected was sorted, coded and entered into SPSS for production of descriptive and inferential statistics. The study found that global sourcing has a significant influence on procurement performance of mega projects in the energy sector in Kenya. The study thus recommends sustained adoption of the global sourcing practice in acquisition of mega projects in the energy sector to enhance the resultant cost, quality, price, and technological benefits.

Keywords: Global Sourcing; Mega projects; Procurement Performance

INTRODUCTION

Around the world, governments are investing heavily in Mega public projects to reverse a profound infrastructure and service backlogs. For instance in Africa, an estimated 600 million people lack access to electricity; almost 380 million people lack clean water in Sub Sahara Africa alone, and general transport infrastructure is dilapidated or inexistent(OECD, 2011). The demand for this public infrastructure, and waning public finance capacity of most government (WB, 2010), has put pressure on governments to deliver these mega projects on time and on budget (Flyvbjerg, 2014).

Globally, Mega projects have exhibited failure. Global statistics reveal failure in 9 of 10 mega projects (Flyvbjerg, 2014) This has been partially, but greatly, linked to poor procurement performance, in the form of protracted procurement process, contractual misunderstanding, inadequate skills, and insufficient risk management (Flyvbjerg, 2014; KPMG, 2012; Mckinsey, 2015) Schlumberger Business Consulting (SBC, 2015) estimates that procurement and contracting process for mega projects explains at least 12% of mega project failure. There is growing consensus among industry professionals and academics (Reeves, 2011, KPMG, 2012, & Mckinsey, 2015), that improvements in pre project phases such as procurement could lead to improvements in delivery of mega projects.

Supply chain management practices, the sets of complete set of actions done in an organization to improve supply chain effectiveness and efficiency, such as Global sourcing, Partnership, Early Supplier involvement (Muhammad, Ali & Shazad, 2013; Karimi & Rafiee (2014), and Jie & Cox, 2013) are increasingly being seen as tools for achieving more effective mega project acquisition in bid to deliver these projects on time and on budget. Quest to reverse mega project failure has seen governments worldwide adopting a myriad of supply chain

management practices including: PPPs, Risk Management, contract management, global sourcing, as well as E-procurement, with much success (Reeves, 2011, & KPMG, 2012)

Statement of Problem

Kenya has prioritized, under the Kenya Vision 2030, a number of Mega projects. However most mega projects have, (or are), experienced procurement related challenges, which threaten their efficient implementation thereby threatening achievement the Vision 2030 aimed at transforming Kenya into a middle income Nation. The energy sector, a critical support sector of the Vision 2030 pillars, plans to increase power production by 10,000Mw by the year 2030, from the current estimated production of slightly above 2000Mw, through an array of mega projects.

Most of the projects including: the KeS24.6 billion school laptop project; KeS200Billion Lamu coal project; KeS15 billion Kinangop power project; KeS700mw Liquefied Natural Gas project; and the $551m greenfield JKIA project; have experienced failure, attributed to procurement related challenges such as: cancelled tender award due to irregularity; socio-political resistance; lack of adequate finances; and non responsive tender process (NCLR, 2014; ROK, 2014; KAA, 2016 & Rita, 2016) Further, an ROK (2056) audit report of firms undertaking energy projects identified massive project failure occasioned by contractor failure due to failure in the procurement mechanism. This raised interest of research on supply chain practices that impact procurement of mega projects in the energy sector. Efficient procurement of mega projects is essential to attain vision 2030 goals.

Specific Objective

To assess how global sourcing influences procurement performance of mega projects in the energy sector in Kenya.

Research Hypothesis

There is no significant influence of global sourcing on procurement performance of Mega projects in the energy sector in Kenya.

LITERATURE REVIEW

Theoretical Review: Porter Value Chain Analysis Model

The value chain analysis model is often attributed to the work of Michael porter (1985) on creating and sustaining competitive advantage by sustaining superior performance. It adopts a process view of an organization; and analysis an organization as a system made of subsystems, each with inputs, transformation process, output; that deliver a valuable offering

inform of products and service to a consumer (Mitchel, Coles & Keane, 2009) According to Gurria (2012) globalization now portends that these activities and support services expand beyond borders as business networks expand to various corners of the world, in the emerging and developing era of global value chains. Value chain analysis model provides the study a heuristics tool for studying the emerging supply chain practice of global sourcing; the sourcing of goods and services beyond geopolitical boundaries (Kanemoto *et al*, 2011)

Gurria (2012) asserts that globalized value chains widen the sourcing scope for organization to include global sourcing. According CIPS (2013), global sourcing is often driven by desire for organizations to exploit global efficiencies (price, technology advances, quality, expertise) while acquiring requirements. Governments being service providers to citizenry (OECD, 2010), could benefit from these global efficiencies through global sourcing. In context of mega project procurement, these benefits could accrue to the procurement process by practicing global sourcing: global competition could result in lower contract prices; technology transfer in mega projects; higher quality attributed to international standards; and more qualified contractors (Roshana, 2008; Crosby, 2011; EIU, 2015).

Empirical Review

Global sourcing is increasingly being considered a strategic sourcing option by organizations worldwide (Loppascher, Cagliano, & Milano, 2011) and can be seen as an extremely effective strategy to achieve operational and strategic efficiency by leveraging on global capabilities (PWC, 2010) Its is often driven by desire for organizations to exploit global efficiencies (price, technology advances, quality, expertise) while acquiring requirements (CIPS, 2013) In comparison to local sourcing, which has a smaller scope, global sourcing could result in more benefits for procuring entities on adoption of a global strategy, due to the widening purchasing scope that results in certain efficiencies and benefits as described above. Governments being service providers to citizenry (OECD, 2010), could benefit from these global efficiencies, while procuring for works, goods and services, whilst adopting global sourcing.

In context of mega project procurement, the following benefits of global sourcing could accrue to the procurement process: global competition could result in lower contract prices; technology transfer in mega projects (contractors from developing nations could be seen to have more experience and expertise, as well as advancement in level of technology (Roshana, 2008)); higher quality due to accessing international standards (such as compliance to ISO standards by contractors) (Crosby, 2011; EIU, 2015). A major issue affecting mega projects is lack of adequate technical capacity of contractor (Ameh & Osegbo, 2011). This could be solved by adopting a global sourcing strategy. When sourcing globally for contractors to undertake

mega projects, there is opportunity to acquire qualified and experienced contractors from developed nations thereby deriving benefits such as: higher technical expertise and experience and technology transfer among other benefits. It can thus be argued that global sourcing practice in acquisition of mega projects could result in better performance of the procurement of mega projects.

Various literatures enlighten this study on various fronts. Schiele *et al* (2011) evaluates the financial impact of global sourcing, while Christopher *et al* (2011) adopts a multi-case study approach to study global sourcing risk management. On the other hand, Haartman and Bengtsson (2015) study the impact of global sourcing on supplier integration and product innovation and establish unique relationships. Crosby (2011) white paper provides plausible procurement strategies for mega projects. Golini and Kalschmidt (2011) studies the moderating impact of global sourcing on inventories through supply chain management, while Oshri *et al* (2009) examines the global sourcing issues and trends. These studies only illuminate and inform fragmented aspects of this study. They fail to answer the question: what is the influence of global sourcing on procurement performance of mega projects in Kenya? An empirical survey could be done in Kenya to examine the relationship between global sourcing and procurement performance of mega projects.

RESEARCH METHODOLOGY

Sekaran (2010) notes the development and execution of an efficient research strategy is a central part of research. A fitting research design, a functional plan outlining and linking research methods and procedures requisite for acquisition of reliable and valid data capable of empirical analysis (Mkansi & Achiampong, 2012), is applied to guide application of appropriate research methods towards attainment of research objectives. The study on Impact of Global sourcing on Procurement performance of mega projects in the energy sector in Kenya adopted an exploratory approach using a descriptive research design. Exploratory research design is a flexible approach that allows consideration of various aspect of the study (Gill & Johnson, 2010), while Descriptive survey research portrays an accurate profile of persons, events, or situations (Cresswell 2009) in their current state.

The study focused on mega projects in the energy sector in Kenya as the unit of analysis. Therefore the population of this study was all the mega projects in the energy sector in Kenya. The target population was thus the 47 mega projects in the energy sector, under the various procuring entities in Kenya; KenGen, KETRACO, KPLC, GDC, Kenya Pipeline, and MoE&P. The study entailed a census of all the 47 mega projects identified in the energy sector in Kenya. Bhattacherjee (2012) notes that a census is preferred when the study population is

small; and is advantageous as it offers opportunity to undertake intense study of population. The unit of observation was the procurement managers in the procuring entities in the energy sector who were suited to provide factual data on acquisition of the mega projects.

Whilst various methods could be used to collect primary data, including questionnaires and interview methods objectively prepared Questionnaires were used. As explained in cooper (2011) and Palinkas (2010), they are preferred over interviews as they provide a more effective and efficient way of collecting data where respondents are spread widely. Objectively designed questionnaires were used to obtain data linking global sourcing and procurement performance of mega projects in the energy sector in Kenya. The questionnaire was divided into two sections; the open ended section sought information on: extent of global sourcing in the mega projects and benefits accruing to the projects from global sourcing. The other section had 10 items that sought information on influence of specific aspects of global sourcing on the acquisition of mega projects.

A pilot study was conducted on 10% of the sample to detect and review weakness of the proposed questionnaire, as recommended by Cooper and Schindler (2011) To test reliability, the study relied on the Cronbach's alpha (α). Global sourcing had a score of 0.899, which is deemed acceptable in line with recommendations by Ritter (2010). The study considered various as aspects of validity, Content, and construct were considered

RESULTS AND DISCUSSION

Response Rate

In the survey of the 47 projects in the energy sector in Kenya, 47 questionnaires were issued. A total of 47 questionnaires were returned. However, only 31 questionnaires were responsive. The unresponsiveness in 16 questionnaires was because some projects were yet to start, or were in the process of acquisition, or had failed to kick off; thus little or no information was available for the projects. Therefore, the study achieved a response rate of 65.9%, with 31 responsive questionnaires, out of 47 issued questionnaires. This is deemed a sufficient response rate in a survey in line with Creswell and Plano (2011) recommendation that a response rate above 60% is sufficient to permit data analysis. Similar studies on procurement practices and procurement performance by Odero and Ayub (2017), and Dede and Theuri (2018) yielded 72% and 82% response rate respectively. This shows that the study's response rate is within the norm. Most of the non responses were because some projects were yet to start, or were in the process of acquisition, or had failed to kick off; thus little or no information was available for the projects.

Estimated Value of the Projects Surveyed

Analysis of the data collected in the survey indicates that projects are estimated to be worth KES 0.6 Trillion (KES 600,000,000,000): The lowest project value was worth KES 202 Million, while the project with highest value was worth KES 100 Billion. All the projects were running for more than two financial years. These projects therefore fall within the description of mega projects as described by Hall and Khan (2006), Mckinsey (2013), and Flyvbjerg (2003), that mega projects are those endeavors, or undertakings, typically having multi-million or even billion dollar budgets; time-frames measured in years, and attracting a high level of public or political attention.

Descriptive Findings on Global sourcing and Procurement Performance

The study sought to understand the extent of global sourcing in the procurement of mega projects. Respondents were asked to indicate the extent to which global sourcing was adopted in procurement of various mega projects. Analysis shows that global sourcing was practiced to a great extent with 94% of the projects reporting the contracting of an international EPC. This finding agrees with Deloitte (2015) and KPMG (2015) reports, that cite surge in number of foreign firms being involved in public mega projects perhaps out of need to improve technical capacity that has been identified as key cause of mega project failure in Africa

The study also sought to understand how various aspects of global sourcing influence procurement of mega projects. Propositions about global sourcing and procurement of the mega projects were made to respondents who were asked to indicate extent, (key: 1-not at all, 2-little extent, 3-moderate extent, 4-great extent, 5- very great extent), to which the propositions characterized the mega projects. Analysis reveals that all propositions on global sourcing and procurement performance had a mean score above 3.73, as shown on Table A-1, which indicates that aspects of global sourcing characterize and influence procurement performance of mega projects greatly. This means that in acquisition of most of the mega projects in the energy sector in Kenya, Global sourcing is a key practice. This finding is in line with the report by KPMG (2015), which found a surge in number of foreign firms, from Australia, UAE, India, and china, undertaking mega projects in the region. It seems to support Villmo (2012) proposition that global sourcing is a key strategy in improving mega project fortunes.

Analysis further reveals high scores (Mean 3.94, SD 0.899; Mean 3.91, SD 0.981; and Mean 3.91, SD 0.723), on aspects of global sourcing, which indicates a great extent level of characterization, that: it exposes the procurement process of mega projects to international standards resulting in better quality; it provides opportunity to select more qualified mega project contractors; and that it exposes the entity to wider purchasing scope which improves

competitiveness. This implies that adoption of the global sourcing practice resulted in wider sourcing scope, more qualified contractors, and international quality standards; which resulted in procurement process cost, cycle time and quality benefits. These findings are in agreement with propositions of Ameh and Osegbo (2011), and Crosby (2011), who assert that global sourcing could result in lower contract prices; technology transfer in mega projects; higher quality due to accessing international standards; and improved technical capacity.

Diagnostic Tests

Data collected on Global Sourcing and procurement performance was tested for normality in line with recommendation by Ghasemi and Zahediasl (2012). Since the unit of observation and analysis was Heads of supply chain or equivalent and Mega projects respectively, data obtained was expected to be seen to be normal. This study relied on the Shapiro-Wilks', W, test; to test Normality of data. The results for the Shapiro-Wilks Test, W, on Global sourcing was not significant (P-value=0.212), which according to Razali and Wah (2011), and Garson (2012) indicates a normal distribution. The study performed the test of multi collinearity by calculating the Variance Inflation Factor values (VIF) and Tolerance as recommended by Collis and Hussey (2014). The results show that VIF of all Global sourcing (VIF=1.387) was less than 10 thus indicating non multi collinearity as recommended in Collis and Hussey (2014).

The study also undertook a test of linearity, using Correlation analysis, to establish whether further analysis would yield the desired relationship (Fields, 2009) that could be further explored using other statistical tools Kothari (2009). The analsysis yielded a Pearson Product Moment Correlation Coefficient, r=0.0646, P-value (0.000), indicating a significant and positive linear relationship between Global sourcing and procurement performance.

Regression Analysis

A regression of procurement performance of mega projects in the energy sector in Kenya on Global sourcing was done using the following model: $Y = \beta 0 + \beta_1 X_1 + \varepsilon$: Where; Y is Procurement Performance, $\beta 0$ is the intercept, β_1 is the change in procurement performance occasioned by a unit change in X_1 (global sourcing).

The analysis shows that the calculated p-value is 0.000, which is less than 0.05, at 95% confidence interval. This implies that the null hypothesis, H_o: *There is no significant influence of global sourcing on procurement performance of Mega projects in the energy sector in Kenya* is rejected. Global Sourcing has a significant influence on Procurement performance of mega projects. The regression analysis further indicates variances ($R^{2)}$ as 0.418 which shows that

41.8% of Procurement performance of Mega projects is influenced by global sourcing practice as shown on Table 1. From this analysis the regression model could be written as:

Procurement performance=0.827+0.057 (global sourcing practice).

This means that an increase in mean index of Global sourcing practice will increase Procurement performance of mega projects by a mean index value of 0.057. The findings also auger well with findings of Oshri *et al* (2009) who predicted rise in practices such as global outsourcing as companies seek to leverage on global capabilities and benefits. These findings also agree with assertions of Gurria (2012) on the Porters value chain and global sourcing, that a widened value chain results in price, technology advances, quality, expertise.

Table 1: Regression of Procurement performance on Global Sourcing

R	R^2	ADJ R^2	Std Error
.646	.418	.399	.53994

F=22.246, Sig=.000, Coefficients: Constant (B=.827, t=1.740, sig=.092),

PPP (B=.057, t=4.717, sig= .000)

CONCLUSION

The study found that global sourcing has a significant influence of global sourcing on procurement performance of Mega projects in the energy sector in Kenya. The study thus concludes that adoption of global sourcing in the procurement of mega projects has a positive influence on Procurement cycle time, cost and quality. Aspects such as wider sourcing scope, exposure to international standards, exposure to more qualified and experienced contractors, and competitiveness of the global markets contribute in enhancing the procurement performance of mega projects in the energy sector in Kenya.

This study therefore recommends further enhancement in adoption of global sourcing in the acquisition of mega projects in the implementation of the energy plan. This would lead to quality, cost, and time benefits. The aspects of international quality standards, more qualified contractors, technology transfer, and wider sourcing scope; would have a positive impact on the procurement performance of mega projects in the energy sector in Kenya, and thus contribute to faster implementation of the energy plan to install 10,000 MW by the year 2030, to support the achievement of the Vision 2030.

The study examined the influence of global sourcing on procurement performance of mega projects in the energy sector in Kenya, using a survey approach. Opportunity exists to examine this relationship more closely using a case study approach. The mega projects exist in

different forms; such as drilling, plant development, transmission and distribution. Examining each form of mega project individually may portend deeper understanding of this relationship. The study also recognizes that various other supply chain practices may influence procurement performance of mega projects. This study on procurement performance of mega projects could be extended to examine influence of other practices on procurement performance of mega projects in the energy sector.

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APPENDIX

Table A-1: Aspects of Global sourcing on Procurement Performance

	Percent (%)						
ITEM	1	2	3	4	5	MEAN	STD D.
Exposes entity to wider purchasing scope which improves competitiveness	0.0%	3.0%	21.2%	57.6%	18.2%	3.91	0.723
Global competition results in comparative price and cost benefits of mega projects	0.0%	6.1%	27.3%	45.5%	21.2%	3.82	0.846
Global sourcing provides opportunity to select more qualified mega project contractors	0.0%	9.1%	24.2%	33.3%	33.3%	3.91	0.980
Exposes the procurement of mega projects to advanced technology resulting in lead time and total cost of ownership benefits	0.0%	9.1%	21.2%	45.5%	24.2%	3.85	0.906
Exposes the process to international standards resulting in better quality	0.0%	9.1%	15.2%	48.5%	27.3%	3.94	0.899
Exposes the procurement process to contractors with higher expertise	0.0%	6.1%	24.2%	54.5%	15.2%	3.79	0.781
Global sourcing provides opportunity to select contractors with wider experience	0.0%	9.1%	15.2%	54.5%	21.2%	3.88	0.857
Global sourcing owing to access to experienced contractors enhances delivery time	0.0%	3.0%	27.3%	54.5%	15.2%	3.82	0.727
Global sourcing enhances opportunity for partnership in mega projects	0.0%	9.1%	24.2%	51.5%	15.2%	3.73	0.839
Provides opportunity for entity to acquire projects at better purchasing terms	0.0%	3.0%	24.2%	48.5%	24.2%	3.94	0.788