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# INFLUENCE OF GREEN PROCUREMENT PRACTICES ON PROCUREMENT PERFORMANCE IN THE COUNTY GOVERNMENT OF VIHIGA, KENYA

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**ABSTRACT**

*This study investigated the influence of green procurement practices on procurement performance in the county government of Vihiga, Kenya. The study adopted descriptive research design and targeted 118 respondents that were perceived to influence the procurement performance function in the county government of Vihiga; from where Yamame sampling formula was used to get a sample size of 92 respondents who were selected using simple random sampling to participate in the study. Structured questionnaires were used to collect data. Both descriptive and inferential statistics were computed using SPSS version 23. Descriptive statistics summarized data using frequencies and percentages as well as measures of central tendency (means) and dispersion (standard deviation) while for inferential statistics, regression and correlation analysis was used to determine both the nature and the strength of the relationship between study variables. Analyzed data was presented in form of tables. Both descriptive and inferential statistics showed that all independent variables (supplier certification, green procurement policy, green ordering lead times and green sourcing costs) significantly influenced procurement performance in the county government of Vihiga, Kenya. The study concluded that one, supplier certification significantly influences green procurement performance, because only qualified and certified suppliers of green products and service was evaluated and prequalified for supply of green products in county governments, and two, adherence to green procurement policy by certified suppliers of green products as enforced by county procurement offices could improve green procurement performance in county governments. The study recommended that one, the procurement office in county governments should ensure that they only certified green products suppliers were prequalified to supply green products and services in the county, two; there should be a stringent enforcement of green procurement policy in all county governments to ensure environmental conservation and biodiversity, and three, procurement committees in county governments should only award green supply tenders to certified suppliers with minimal green ordering lead time so as to avoid cases of delayed delivery of procured goods or services.*

***Key Words:*** *supplier certification, green procurement, green ordering lead times, sourcing costs*

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## INTRODUCTION

Procurement performance involves allocation of sufficient resources financial, personnel, time, and establishing a chain of command or organizational structure. It involves assigning responsibility of specific tasks or processes to specific individuals or groups. It also involves managing the process. This includes monitoring results, comparing to benchmarks and best practices, evaluating the efficacy and efficiency of the process, controlling for variances, and making adjustments to the process as necessary. Procurement performance is an on-going, never-ending, integrated process requiring continuous reassessment and reformation (Olson et al., 2005).

In Kenya both the national and county governments rely on contractors and or known suppliers to take care of many procurement activities. That is many large public corporations and institutions in Kenya rely on procurement to access most of their products and services, through purchasing and sourcing as well as tendering and contracting. In order to ensure fairness during the bidding process, the Government through the Public Procurement Oversight Authority (PPOA), Public Procurement and Asset Disposal Act (PPDA) of 2015, and the Procurement Regulations of 2015 entrenched the concept of competitive procurement in all government agencies. That is, the aims of PPOA and PPDA is to establish procedures for procurement and the disposal of unserviceable, obsolete or surplus stores and equipment by public entities to maximize economy and efficiency, promote competition and ensure that competitors are treated fairly, promote the integrity and fairness of those procedures, increase transparency and accountability in those procedures and to increase public confidence in those procedures and facilitate the promotion of local industry and economic development. But despite these standards, Kenya loses a lot of taxpayers' money to improper procurement practices (GoK, 2017).Therefore poor procurement practices have also hampered service delivery in both national and county government units.

In regard to this study, the Public Procurement and disposal Act, 2005 and subsequent regulations in the year 2006 and 2009, Public Procurement and Asset Disposal Act (PPDA) of 2015, and the Procurement Regulations of 2015 entrenched the concept of competitive procurement in all government agencies, which are the core points of reference on public procurement in Kenya but makes a very weak reference to green public procurement.

Further, Omwoha (2015) insisted that Green Procurement is significant in countries and regions where it is largely implemented because it ensures resources sustainability to cater for future generations, transforms the market to be more innovative to produce green products, cost saving during procurement and disposal of goods and services. In addition governments through their large purchasing power have used Green Public Procurement (GPP) as a tool to achieve environmental objectives by buying environmentally friendly goods yet some county governments are reported to only have this concept on paper (Omwoha, 2015).

### Statement of the problem

Public procurement though touted as the most effective way of involving public participation in the procurement process and thus improve service delivery has experienced an appalling performance in county governments in Kenya. A number of researches on determinants of procurement performance have revealed varied assertions on what really influences procurement performance in public institutions with little regard to environmental conservation issues.

More so, studies have been done in Kenya on procurement in general but very little on green procurement. For example, Mwirigi (2007) did a study on the green supply chain management practices by manufacturing firms in Kenya; Obiero (2008) did a study on the challenges in the


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implementation of the 2005 procurement Act on the Kenyan Ministry of Higher Education, Science and Technology; Owuori (2010) reviewed the bid processing time for procurement in donor funded public projects in Kenya; (2010) studied the effects of operational management on the procurement of pharmaceutical products in developing countries with a specific focus on Kenya Medical Supplies Agency (KEMSA) with little empirical data on the relationship between green procurement and procurement performance.

Further, some researchers Nordas et al., (2012); Su et al., (2014) identified lead time issues in procurement related researches but most views were based on manufacturing industries and supply chain management areas with little regard to the procurement process in public organizations like county governments where delays in time required for supply and delivery of goods and services has really affected procurement performance function in the county governments.

In this regard, since green procurement has become a policy tool for many Governments due to concerns of the environment sustainability, climate change and its effects; many governments and international agencies are thus consciously including environmental and social considerations in their procurement processes, yet in Kenya, adoption of green procurement has been slow resulting in lower diffusion rate. Therefore lack of empirical evidence on feasible contributing factors of public procurement performance function in public organization like county governments motivated this study to investigate the influence of green procurement practices on procurement performance in the county government of Vihiga, Kenya.

**Objectives of the study**

The general objective of the study is to investigate influence of green procurement practices on procurement performance in the county government of Vihiga, Kenya. The study's specific objectives were;

- To examine influence of supplier certification on procurement performance in the county government of Vihiga, Kenya.
- To determine influence of green procurement policy implementation on procurement performance in the county government of Vihiga, Kenya.
- To assess the influence of ordering lead time on procurement performance in the county government of Vihiga, Kenya.
- To evaluate the influence of sourcing costs on procurement performance in the county government of Vihiga, Kenya.

The rresearch hypotheses were;

- **$H_{01}$:** Supplier certification does not significantly influence procurement performance in the county government of Vihiga, Kenya.
- **$H_{02}$:** Green procurement policy does not significantly influence procurement performance in the county government of Vihiga, Kenya.
- **$H_{03}$: O**rdering lead time does not significantly influence procurement performance in the county government of Vihiga, Kenya.
- **$H_{04}$:** Sourcing costs does not significantly influence procurement performance in the county government of Vihiga, Kenya.

## LITERATURE REVIEW

**Institutional Theory of Strategic Capacity and Competitive Advantage**

Institutional environment is defined as crucial to organizational behavior, or as an independent variable in relation to it. Institutional theory addresses the macro organizational environment and identifies rules, beliefs and values created and consolidated through social interaction and routines (More, Telles, Marinho &Correa, 2016). Nevertheless, government plays a major role in the adoption of Green procurement. With this in mind, it's a necessity for firms to comply with environmental regulations.

Kabergey and Richu (2015), organizations are formal institutions that have structures and


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stakeholders who have varied interests. To curb conflict of interest, the government has enacted regulations and conventions that guide organizational practices. The researchers further posit that green procurement policy coupled with reverse logistics must be implemented through well-developed models and a collaborative and participative approach. In addition, there has been an increased pressure from the government, NGOs and the general community on issues concerning environmental management. This theory will be useful in determining the influence of green procurement practices on procurement performance in the county government of Vihiga, Kenya.

**Resource Based View theory**

This RBV theory (Barney, 1991), assumes that a firm's resources and capabilities are its most important assets; thus the primary concern of RBV theory is about obtaining access to another firm's core competencies to gain competitive advantage (Steinle &Schiele, 2008). In this regard, Steinle and Schiele (2008) assert that suppliers can be regarded as resources in case they are "sufficiently bound to a firm". With these assumptions they clearly follow the extended resource based view, implying, resources can also be obtained through inter-firm connection from the external environment. They proceed by setting suppliers in context with the four resource attributes, mentioned in Barney (1991).

**Legitimacy theory**

Proponed by Suchman (1995), legitimacy theory asserts that legitimation has a crucial influence on 'how the organization is built, how it is run, and simultaneously, how it is understood and evaluated'. Legitimacy may serve as either a source of additional external resources (Bitektine, 2011) or as a tool for consolidating organizational reputation, either externally or internally.

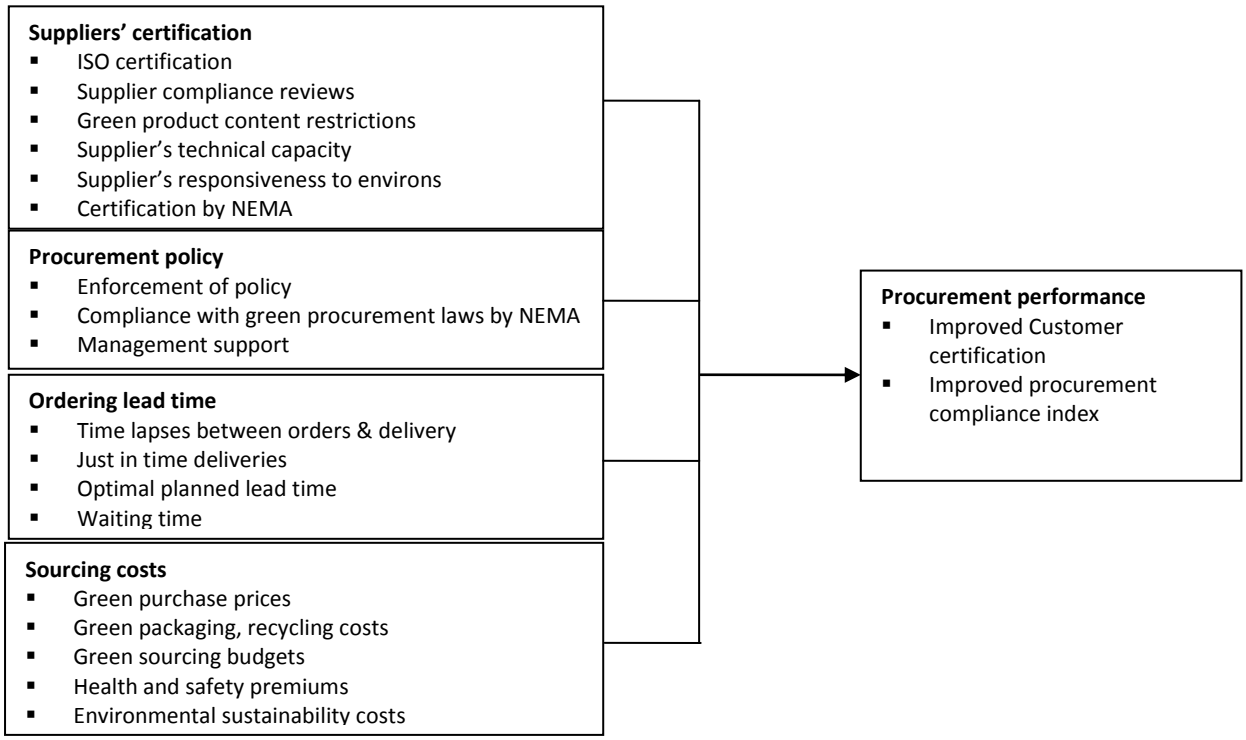


**Figure 1: Conceptual Framework**

**Empirical Review**

Saunders (2007) found that recognition of supplier resistance or acceptance was essential for compliance with the green procurement rules. That is to avoid non-compliance all suppliers may be required to provide proof of their commitment to


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environmental protection. This may take the form of statements on the steps they are taking to reduce their impact on environment, or alternatively to demonstrate that they are not in breach of any statutory requirements relating to the environment. Further, suppliers are required to consider the environmental impact of their products through the whole life cycle.

Walker and Brammer (2009) also found that the main problems limiting adoption of green public procurement was difficulty in engaging suppliers. Some green procurement initiatives were found to be hampered by unwillingness of suppliers to cooperate (Lysons & Farrington, 2012). This unwillingness could be due to a number of reasons including concerns over sensitive information, poor supplier practices, and resource constraints which definitely affects procurement performance.

Ashenbaum (2008) found that in the public sector, procurement officers are the agents of the principal (the state) to realize the goals and objectives of the state. Therefore, the goals of the agent must be in conformity with that of the principal (the state) in order to achieve efficient reform in the green public procurement programme, thus top management support is critical to the success of a successfully sustainable green procurement strategy. Bjorklund (2011) found that priorities among the top/middle management are important drivers in the environmental purchase. Without high level support employees are often unwilling or unable to pursue green public procurement initiatives (Ashenbaum, 2008).

Rha (2010) did a study on the impact of green supply chain initiatives on supply chain performance and revealed a significant positive relationship between green supply chain management initiatives and three supply chain performance parameters namely resource, output, and flexibility. These studies all point to the fact that green procurement, just like other socially responsible initiatives, have an impact on procurement performance and that there should be an enforcement of green procurement policies by the management whether in private or public organization.

Hopp and Spearman (2010) asserts that the ability of the supplier to follow the predefined delivery schedule is always the prime criteria for selection in this fast moving world. This means that suppliers who keep their promises are easier and profitable to work with. Thus, explained lead time as the time between order and placement of material and the actual delivery- the shorter the lead time, the better the supplier. Every purchasing firm will be comfortable when the lead time is shortest possible. Long lead time has the impression that the specific supplier is less efficient or he just has more customers than he can serve thus delaying deliveries.

Further, lead time reduction has long been considered a fundamental objective for overall business improvement; and lead time can be understood as an anticipated time to complete a process but is sometimes confused with cycle time. Cycle time is the time it actually takes for a job to go from the start to the end of the process. It is the "real" time it takes for a job to go through a process; thus, it may vary from job to job. In construction for instance, there are two main types of lead time, (1) customer and (2) construction lead time. Customer lead time is the time between order placement and fulfillment. Construction lead time is the longest "allowable" cycle time (Hopp & Spearman, 2010).

A study by Bouwer et al. (2006) indicated increased cost of green products compared to those not environmentally friendly as a major barrier to adoption. Brammer and Walker (2011) says that often sustainable products simply cost more than conventional products where there is little regard to either the environmental or social implications of the production process in addition to cost for employee training or extended time engagement with suppliers.

Bouwer et al. (2006) also found that given the tight budget constraints and countervailing objectives

faced by most public sector organizations, perceptions regarding the cost-effectiveness of Green public procurement do play a particularly important role in decision making. This is because the role of financial aspects attached to Green public procurement, particularly perceptions of the financial viability of implementing Green public procurement play crucial role in shaping the degree to which procurement policies are acted upon since green/socially responsible production methods are often perceived of as being inherently more expensive than other methods.

Lysons and Farrington (2012) also found that the supply-side of the procurement transaction plays a crucial role in availability of sustainably-produced goods and services. Given that some of the goods and services procured by the public sector are highly specialist, it is possible that identifying sustainable sources of supply may be very challenging and costly in some contexts.

Teutemann (2010) also asserted that the sole concern of bureaucrats in the public sector is to try to exhaust fully their procurement budget so as to avoid reductions in their future budget, hence cost reductions due to competitive procurement procedures in one year do not necessarily result in increase in subsequent budgets that must foster environmental awareness in procurement.

Manitoba (2010), also asserted that green procurement initiatives can yield positive economic benefits for organization‘s procurement in terms of risk management, cost reduction and revenue growth. the advantages of green procurement initiatives, policies and programs among organizations like the commercial corporations help reduce expenditure and waste; increase resource efficiency; and influence production, markets, prices, available services and organizational behavior, it‘s important to note that it assist countries in meeting multilateral requirements such as the Kyoto protocol and Rotterdam convention, International Standards Organization and other bodies that have established guidelines for green procurement programs.

## METHODOLOGY

This study adopted descriptive research design. The target population for this study or those cases that contained the desired information consisted of procurement officers, Inspection and acceptance committee members, procurement ad hoc committee members, monitoring and implementation committee members, and finance officers that were perceived to influence the procurement performance function in the county government of Vihiga. The study’s sample size was 92. The researcher formulated structured questionnaires (close ended questions) based on the conceptualized study variables then used to collect primary data from respondents. A pilot study was done on 10 respondents selected from the senior management officers in the county government of Kisumu which neighbors Vihiga county government, the study area. Both descriptive and inferential statistics was computed using SPSS version 23. Analyzed data was presented in form of tables. The multiple regression analytical model equation was;

$y = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+ \beta_4X_4 + e$

y = Procurement performance

$\beta_0$ = Constant

$X_1$ = Suppliers certification

$X_2$ = Green procurement policy

$X_3$ = Green ordering lead time

$X_4$ = Green sourcing costs

$\{\beta_0- \beta_5\}$ = Beta coefficients

e = the error term

## RESULTS

### Supplier certification and procurement performance

This assessed whether supplier certification influenced procurement performance in the county government of Vihiga. The descriptive summaries of responses were shown in table 1.

**Table 1: Descriptive statistics: Supplier certification**

| Statement | 5 | 4 | 3 | 2 | 1 | Mean | Std.Dev |
|---|---|---|---|---|---|---|---|
| All suppliers of major county goods/services have ISO certification | 14(17.3) | 39(48.2) | 13(16.0) | 8(9.9) | 7(8.6) | 3.56 | 0.841 |
| The procurement committee does regular supplier compliance reviews in line with green procurement | 19(23.5) | 37(45.7) | 12(14.8) | 6(7.4) | 7(8.6) | 3.68 | 0.871 |
| Prequalified suppliers have technical capacity in green procurement | 13(16.0) | 34(42.0) | 16(19.8) | 10(12.3) | 8(9.9) | 3.42 | 0.992 |
| Most suppliers have high responsiveness to local environment | 12(14.8) | 43(53.1) | 11(13.6) | 7(8.6) | 8(9.9) | 3.54 | 0.852 |
| Most suppliers adhere to green product content restrictions | 16(19.8) | 44(54.3) | 12(14.8) | 5(6.2) | 4(4.9) | 3.78 | 0.911 |
| Supplier certification in green supplies is key in selection of suppliers of procured goods/services | 12(14.8) | 39(48.2) | 15(18.5) | 8(9.9) | 7(8.6) | 3.51 | 0.831 |
| **Valid listwise** | **81** | | | | | | |
| **Grand mean** | **=** 3.582 | | | | | | |

From table 1 most respondents agreed (48.2%) and strongly agreed (17.3%) that all suppliers of major county goods/services have ISO certification, implying that the procurement officers in Vihiga county government had at least tried to ensure that all suppliers of major county goods/services had ISO certification. Secondly, most respondents agreed (45.7%) and strongly agreed (23.5%), though 14.8% were uncertain that the procurement committee did regular supplier compliance reviews in line with green procurement. This implied that though the procurement committee does regular supplier compliance reviews in line with green procurement, there are some respondents who were uncertain about it thus need an improvement in it.

More so, there were missed reactions about the statement that 'prequalified suppliers have technical capacity in green procurement'; because while 42.0% of respondents agreed, 19.8% were uncertain while 12.3% disagreed, thus raising issues of technical capacity of prequalified suppliers of green procurement products. To reinforce this, while most respondents agreed (53.1%) that most suppliers had high responsiveness to local environment, 13.6% of respondents were uncertain further indicating doubts that all suppliers in Vihiga county have high responsiveness to local environment.

Further, most respondents agreed (54.3%) and strongly agreed (19.8%) that most suppliers adhere to green product content restrictions, thus there are cases of suppliers who do not adhere to green product content restriction- a loophole that is definitely created by some corrupt procurement officers in the county government of Vihiga. Most respondents also agreed (48.2%) and strongly agreed (14.8%) that supplier certification in green supplies is key in selection of suppliers of procured goods/services. The grand mean is 3.582 rounded off to 4 which is agree on the Likert scale of measurement, which means that most respondents agreed that supplier certification has an effect on green procurement performance in the county government of Vihiga. This is supported by Nasiche and Ngugi (2014) asserted that, to many procurement practitioners, the procurement laws


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are not explicitly clear and in many case their interpretation is subjective. Therefore, familiarity with the rules by both purchasers and suppliers can influence the chance that public agents will comply with the rules. This leads to the notion that there exist a relationship between familiarity with the green procurement rules and its compliance through certification.

Lisa (2010) also asserted that culture plays a central role in the supplier certification and compliance process and associated outcomes. Due to regulatory reforms and changing community expectations, the role of culture in organizational compliance has gained momentum and basing on the competing values model (hierarchical culture), which involves enforcement of rules, conformity and attention to technical matters, individual conformity and compliance are achieved through enforcement of formerly stated rules and procedures of green procurement.

**Green procurement policy and procurement performance**

This assessed whether green procurement policy influence procurement performance in the county government of Vihiga. The descriptive summaries of responses were shown in table 2.

**Table 2: Descriptive statistics: Green procurement policy**

| Statement | 5 | 4 | 3 | 2 | 1 | Mean | Std. Dev |
|---|---|---|---|---|---|---|---|
| There is strict adherence to legal & regulatory framework on green procurement | 14(17.3) | 37(45.7) | 14(17.3) | 9(11.1) | 7(8.6) | 3.52 | 0.863 |
| There is full enforcement of green procurement policy | 15(18.5) | 39(48.2) | 10(12.3) | 9(11.1) | 8(9.9) | 3.54 | 0.935 |
| There is strict compliance with green procurement ethics | 15(18.5) | 38(46.9) | 13(16.1) | 7(8.6) | 8(9.9) | 3.56 | 0.983 |
| The entire county government senior management fully supports green procurement policy | 13(16.0) | 40(49.4) | 14(17.3) | 8(9.9) | 6(7.4) | 3.57 | .806 |
| All county government departments have fully embraced the green procurement policy | 13(16.0) | 45(55.7) | 10(12.3) | 6(7.4) | 7(8.6) | 3.63 | 0.912 |
| Generally, compliance with green procurement policy influence procurement performance | 17(21.0) | 44(54.3) | 11(13.6) | 5(6.2) | 4(4.9) | 3.80 | 0.905 |
| **Valid list wise 81** | | | | | | | |
| **Grand mean =** 3.603 | | | | | | | |

From table 2, most respondents agreed (45.7%) and strongly agreed (17.3%) while 17.3% were uncertain and 11.1% disagreed that that there was strict adherence to legal and regulatory framework on green procurement, meaning that that there are case of non-adherence to green procurement legal and regulatory frameworks which definitely can have a negative effect on procurement performance. Secondly, 48.2% and 18.5% of respondents agreed and strongly agreed respectively that there is full enforcement of green procurement policy while 11.1% disagreement to the statement implying that the green procurement policy has not been fully enforced in the county government of Vihiga.

Further, only 46.9% and 18.5% of respondents agreed and strongly agreed respectively that there was strict compliance with green procurement ethics, implying that there are cases of no strict compliance with green procurement ethics as confirmed by 8.6% and 9.9% who disagreed and strongly disagreed respectively to the statement. In terms of managerial support for green


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procurement, 49.4% and 16.0% agreed and strongly agreed respectively that the entire county government senior management fully supports green procurement policy. This was because without management support, most policies do not really get fully implemented.

In terms of green procurement policy enforcement at departmental level, most respondents agreed (55.7%) and strongly agreed (16.0%) respectively that all county government departments have fully embraced the green procurement policy, however, 12.3% and 7.4% who were uncertain and disagreed respectively to the statement implies that there could departments not really embracing green procurement policy, thus affecting its full implementation.

On overall, most respondents agreed (54.3%) and strongly agreed (21.0%) respectively that generally, compliance with green procurement policy influence procurement performance. The grand mean was 3.603 rounded to 4 which is agree on the Likert sale of measurement implying that most respondents agreed that compliance with green procurement policy influence procurement performance. This is supported by Obayasi Corporation (2001) who reported that in Japan, the Green Procurement Law urges the businesses and citizens of Japan to choose eco-friendly goods, as much as achievable when buying or renting goods or receiving services, while also urging the businesses of Japan to provide, in an apt manner, the essential information to recognize the environmental impact in relation to said goods (Obayasi Corporation, 2001). That is, the Green Purchasing Law took effect in April 2001, and it illustrates the obligation of the Japanese government and independent administrative institutions and local governments to institute policies for green purchasing and to issue their purchasing performance data. Relevant laws included the Basic Law for Establishing a Recycling-based Society and the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities, also known as the Green Purchasing Law.

Comparatively, the main aim of the Botswana green procurement policy is to ensure that the system is not corrupt. Nevertheless, a system of granting of preferences is permitted in the Botswana tendering system. As race is downplayed as a factor in Botswana society, such preferences do not depend on race, disability or gender; the system of preference is based on whether the consultancy or contracting company is owned by Botswana citizens (Jodie, 2004).

**Ordering lead time and procurement performance**

This assessed whether ordering lead time influence procurement performance in the county government of Vihiga. The descriptive summaries of responses are shown in table 3.

**Table 3 : Descriptive statistics: ordering lead time**

| Statement | 5 | 4 | 3 | 2 | 1 | Mean | Std.Dev |
|---|---|---|---|---|---|---|---|
| Time lapses between green ordering & delivery affects lead time of green procured goods/services | 11(13.6) | 36(44.5) | 15(18.5) | 10(12.3) | 9(11.1) | 3.37 | 0.898 |
| Customer & construction lead times influence procurement performance | 15(18.5) | 38(46.9) | 15(18.5) | 7(8.7) | 6(7.4) | 3.60 | 0.914 |
| Mean time to supply or repair construction machineries influences procurement performance | 12(14.8) | 36(44.5) | 14(17.3) | 10(12.3) | 9(11.1) | 3.40 | 0.811 |
| Waiting time to supply green goods or services has | 12(14.8) | 39(48.2) | 13(16.0) | 9(11.1) | 8(9.9) | 3.47 | 0.874 |


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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a bearing on the procurement performance in the county government | | | | | | | |
| Optimal planned lead time in supply of green goods and services really influences procurement performance | 15(18.5) | 45(55.6) | 10(12.3) | 6(7.4) | 5(6.2) | 3.73 | 0.949 |
| Generally lead time variability in green procurements influences procurement performance | 14(17.3) | 40(49.4) | 12(14.8) | 8(9.9) | 7(8.6) | 3.57 | 0.850 |
| **Valid listwise 81** | | | | | | | |
| **Grand mean = 3.523** | | | | | | | |

From table 3, most respondents agreed (44.5%) and strongly agreed (13.6%) that time lapses between green ordering and delivery affects lead time of green procured goods/services, implying high time lapses negatively affects service delivery, thus blamed on procurement departments. Secondly, 46.9% and 18.5% of respondents agreed and strongly agreed respectively that customer and construction lead times influence procurement performance, implying that when constructions take long before completion, most users or customers will definitely blame the procurement department for awarding tenders to rogue constructors.

Thirdly, 44.5% and 14.8% of respondents agreed and strongly agreed respectively that mean time to supply or repair construction machineries influences procurement performance, thus long mean times to repair construction machines will cause work completion anxiety on both the users and the procurement officer. To reinforce this, 48.2% and 14.8% of respondents agreed and strongly agreed respectively that waiting time to supply green goods or services has a bearing on the procurement performance in the county government; while 55.6% and 18.5% of respondents agreed and strongly agreed respectively that optimal planned lead time in supply of green goods and services really influences procurement performance.

On overall, most respondents agreed (49.4% and strongly agreed (17.3%) that generally lead time variability in green procurements influences procurement performance. The grand mean is 3.523 rounded to 4 which is agree on the Likert sale of measurement implying that most respondents agreed that green ordering lead time influence procurement performance. This was supported by Owour (2010) who while studying on corporations in Kenya found that majority of the corporations procure goods in a period less than 30days, procure work in a period of between 30 to 60days while most of the corporations procure services in a period less than 30days, therefore implying that green ordering lead time may hinder the implementation of the green procurement initiatives thus affects procurement performance of the state corporations in Kenya (Owour, 2010).

**Sourcing costs and procurement performance**

This assessed whether sourcing costs influence green procurement performance in the county government of Vihiga. The descriptive summaries of responses are shown in table 4.

**Table 4: Descriptive statistics: sourcing costs**

| Statement | 5 | 4 | 3 | 2 | 1 | Mean | Std.Dev |
|---|---|---|---|---|---|---|---|
| Purchase prices influence procurement performance | 15(18.5) | 39(48.2) | 12(14.8) | 8(9.9) | 7(8.6) | 3.58 | 0.960 |
| Green packaging, recycling | 19(23.5) | 38(46.9) | 11(13.6) | 7(8.6) | 6(7.4) | 3.70 | 0.845 |


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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| costs influence procurement performance | | | | | | | |
| Health and safety premiums influence procurement performance | 14(17.3) | 34(42.0) | 15(18.5) | 10(12.3) | 8(9.9) | 3.44 | 0.947 |
| Sourcing budgets influence procurement performance | 12(14.8) | 44(54.4) | 10(12.3) | 7(8.6) | 8(9.9) | 3.56 | 0.951 |
| Environmental sustainability costs influence procurement performance | 15(18.5) | 46(56.8) | 11(13.6) | 5(6.2) | 4(4.9) | 3.78 | 0.987 |
| Generally assumed sourcing costs influence procurement performance | 12(14.8) | 39(48.2) | 13(16.0) | 9(11.1) | 8(9.9) | 3.47 | 0.874 |
| **Valid listwise 81** | | | | | | | |
| **Grand mean =** 3.588 | | | | | | | |

From table 4, most respondents agreed (48.2%) and strongly (18.5%) agreed that green purchase prices influence procurement performance, while 46.9% and 23.5% of respondents agreed and strongly agreed respectively that green packaging, recycling costs influence procurement performance, implying that there could be costs associated with green products plus their packaging and recycling. More so, 42.0% and 17.3% of respondents agreed and strongly agreed respectively that health and safety premiums influence procurement performance, while 54.4% and 14.8% of respondents also agreed and strongly agreed respectively that green sourcing budgets influence procurement performance, thus, green budgets are slightly higher since green products and services are also slightly expensive. This is reinforced by 56.8% and 18.5% of respondents who agreed and strongly agreed respectively that environmental sustainability costs influence procurement performance.

On overall, most respondents agreed (48.2%) and strongly agreed (14.8%) that generally, assumed green sourcing costs influence procurement performance. The grand mean was 3.588 rounded to 4 which was agree on the Likert sale of measurement implying that most respondents agreed that green sourcing costs influence procurement performance. This is supported by Faith-Ell et al., (2010) who conducted a study on Green Purchasing Strategies: Trends and Implications and found that the biggest challenge to the effective implementation of green purchasing is the cost and income, and the environment friendly packaging is the key to the success of the project. Brammer and Walker (2007) noted that the role of financial aspects of sustainable procurement. In particular perceptions of the financial viability of implementing sustainable procurement are expected to play a crucial role in shaping the degree to which sustainable procurement policies are acted upon since green/socially responsible production. Belfit, Sexton, Schweber, and Handcock, 2011) argues that Sustainable Procurement practices could be challenged by the fact that sometimes the returns of adopting sustainable procurement decisions may not be received by those that experience the additional cost.

**Inferential analysis**

Accuracy of data was also checked since the scales of measurement were all valid and reliable since questions had content validity and cronbach's alpha (which is a measure of reliability) values were 0.7 and above thus met this assumption. The number of cases of the independent variable ought to be at least 20. This study had four independent variables; therefore, the minimum cases ought to be 2x20 = 40. This study sample size was 92, hence met this assumption. Correlation analysis showed that all independent variables (supplier certification, green

procurement policy, green ordering lead time, green sourcing costs) had significant linear relationship with the dependent variable (procurement performance). The highest correlation coefficient between all pairs of independent variables (supplier certification, green procurement policy, green ordering lead time, green sourcing costs) was 0.769, which was below the correlation coefficient threshold of 0.9, thus multicollinearity assumption was checked and not violated.

**Table 5: Correlations**

| | | Supplier Certification | Green Procurement Policy | Green Ordering Lead Time | Green Sourcing Costs | Procurement Performance |
|---|---|---|---|---|---|---|
| Supplier Certification | Pearson Correlation | 1 | | | | |
| | Sig. (2-tailed) | | | | | |
| | N | 81 | | | | |
| Green Procurement Policy | Pearson Correlation | .535** | 1 | | | |
| | Sig. (2-tailed) | .000 | | | | |
| | N | 81 | 81 | | | |
| Green Ordering Lead time | Pearson Correlation | .611** | .629** | 1 | | |
| | Sig. (2-tailed) | .000 | .000 | | | |
| | N | 81 | 81 | 81 | | |
| Green Sourcing Costs | Pearson Correlation | .581** | .616** | .638** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | |
| | N | 81 | 81 | 81 | 81 | |
| Procurement Performance | Pearson Correlation | .720** | .769** | .721** | .668** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 81 | 81 | 81 | 81 | 81 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Multiple regression analysis**

Linear regression analysis showing both the F values and the corresponding significant values revealed that the four independent variables (supplier certification, green procurement policy, green ordering lead time and green sourcing costs) were indeed different from each other and that they affected the dependent variable (procurement performance) in a different manner, hence, the possibility of running multiple regression. The mandatory model assumptions for running multiple regression analysis were also checked and met. The table 6 showed the multiple regression results of the combined effects of the four independent variables (supplier certification, green procurement policy, green ordering lead time and green sourcing costs). The results showed that the F-statistics produced was significant (F=34.823, *significant* at *p<.001*), thus confirming the fitness of the model. For an $R^2$ of 0.647, this indicated that the conceptualized study model explained 64.7% of the variations in the procurement performance in the county government of Vihiga, while other factors not in this conceptualized study model accounts for 35.3%, thus, it is a good model.


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**Table 6 : Multiple regression analysis**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .804[a] | .647 | .628 | .92058 | .647 | 34.823 | 4 | 76 | .000 |

a. Predictors: (Constant), Green Sourcing Costs, Supplier Certification, Green Procurement Policy, Order Lead time

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 118.045 | 4 | 29.511 | 34.823 | .000[b] |
| | Residual | 64.408 | 76 | .847 | | |
| | Total | 182.453 | 80 | | | |

**Table 7: Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 1.409 | .371 | | 3.803 | .000 |
| | Supplier Certification | .743 | .135 | .540 | 3.162 | .002 |
| | Green Procurement Policy | .850 | .202 | .813 | 4.479 | .000 |
| | Order Lead time | .507 | .246 | .383 | 2.063 | .042 |
| | Sourcing Costs | .789 | .218 | .742 | 4.654 | .000 |

a. Dependent Variable: Procurement Performance

Further, from the values of unstandardized regression coefficients with standard errors in parenthesis, all the independent variables (supplier certification; β = 0.743 (0.135) at p<0.05; green procurement policy; β = 0.850 (0.202) at p<0.01; green ordering lead time; β = 0.507 (0.246) at p<0.05, green sourcing costs; β = 0.789 (0.218) at p<0.05; were significant predictors of the procurement performance in the county government of Vihiga (dependent variable). Therefore, the multiple regression equation for overall significant influence of the independent variables (supplier certification, green procurement policy, ordering lead time and sourcing costs) on the procurement performance in the county government of Vihiga (dependent variable) was;

(v) $y= 1.409+0.743X_1+0.850X_2+ 0.507X_3 + 0.789X_4$

Where;

Y= procurement performance in the county government of Vihiga

$X_1$= supplier certification

$X_2$= green procurement policy

$X_3$= ordering lead time

$X_4$= sourcing costs

**Hypothesis Testing**

Study **hypothesis one** stated that supplier certification does not significantly influence procurement performance in the county government of Vihiga, Kenya. The study results indicate that there is a positive and significant effect of supplier certification on the procurement performance in the county government of Vihiga (β= 0.743 (0.135); at p<.05). **Hypothesis one was therefore rejected**. The results therefore implied that a single improvement in quality supplier certification will yield 0.743 unit increase in the procurement performance in the county government of Vihiga. The results were supported by Manitoba (2010) insisted on the need for

supplier certification so as to comply with green procurement, thus insisted that commitment to purchase green encourages organizations to continuously improve the environmental sustainability of their purchasing decisions. For governments, green procurement can help to: reduce any negative and unintended impacts on the environment like pollution and deterioration of local air quality; support companies that provide products and services that have fewer environmental impacts and stimulate "green," innovative product development and business development; Save the amount of money spent on cleaning up pollution, by preventing it in the first place; also this Sends a message to manufacturers and service providers that consumers will recognize their environmental efforts; create a scale effect thus reducing production costs by the sheer scale of demand for green products and services.

Study **hypothesis two** stated that green procurement policy does not significantly influence procurement performance in the county government of Vihiga, Kenya. The study results indicated that there was a positive and significant effect of green procurement policy on the procurement performance in the county government of Vihiga (β= 0.850 (0.202); at p<.01). **Hypothesis two was therefore rejected**. The results therefore imply that a single improvement in effective green procurement policies will yield 0.850 unit increase in the procurement performance in the county government of Vihiga. The results are supported by Rha (2010) who did a study on the impact of green supply chain initiatives on supply chain performance and revealed a significant positive relationship between green supply chain management initiatives and three supply chain performance parameters namely resource, output, and flexibility. These studies all point to the fact that green procurement, just like other socially responsible initiatives, have an impact on procurement performance and that there should be an enforcement of green procurement policies by the management whether in private or public organization.

Study **hypothesis three** stated that ordering lead time does not significantly influence procurement performance in the county government of Vihiga, Kenya. The study results indicated that there was a positive and significant effect of green ordering lead time on the procurement performance in the county government of Vihiga (β= 0.507 (0.246); at p<.05). **Hypothesis three was therefore rejected**. The results therefore implied that a single improvement in efficient ordering lead time would yield 0.507 unit increase in the procurement performance in the county government of Vihiga.

Lastly, study **hypothesis four** stated that sourcing costs does not significantly influence procurement performance in the county government of Vihiga, Kenya. The study results indicated that there is a positive and significant effect of green sourcing costs on the procurement performance in the county government of Vihiga (β= 0.789 (0.218); at p<.05). **Hypothesis four was therefore rejected**. The results therefore implied that a single improvement in affordable green sourcing costs would yield 0.789 unit increase in the procurement performance in the county government of Vihiga.

## CONCLUSIONS

First the study concluded that supplier certification significantly influences green procurement performance, because only qualified and certified suppliers of green products and service will be evaluated and prequalified for supply of green products in county governments. Secondly, adherence to green procurement policy by certified suppliers of green products as enforced by county procurement offices can improve green procurement performance in county governments. Thirdly, efficient ordering lead time significantly improve green procurement performance in county governments due to reduced waiting time for procured green products and services. Lastly, affordable sourcing costs significantly influence


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green procurement performance in county governments.

## RECOMMENDATIONS

First, the procurement office in county governments should ensure that only certified green products suppliers are prequalified to supply green products and services in the county. Secondly, there should be a stringent enforcement of green procurement policy in all county governments to ensure environmental conservation and biodiversity. Thirdly, procurement committees in county governments should only award green supply tenders to certified suppliers with minimal ordering lead time so as to avoid cases of delayed delivery of procured goods or services. Lastly, the procurement committees in county governments should ensure that there is procurement of economical and quality green products so as to alleviate fears associated with high sourcing costs which discourages potential innovators and suppliers of green products and services.

### Areas for further research

First, a similar longitudinal study can be done on public firms that have practiced green procurement for like five years to assess its long term impact on procurement performance. Secondly, another study can be done to assess influence of the quality and durability of green procured products on sustainability of the green procurement performance.

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