FACTORS INFLUENCING ADOPTION OF GREEN PROCUREMENT PRACTICES BY MANUFACTURING FIRMS IN KENYA: A SURVEY OF FIRMS IN KIAMBU COUNTY

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Abstract: The contribution of procurement to global economy and the Kenyan economy in particular is recognized and well documented. Given their importance, it is vital that the organization procures environmentally friendly products. The purpose of this project was to investigate the factors influencing adoption of green procurement practices by manufacturing firms in Kenya: a survey of firms in Kiambu County. The specific objectives were to determine the influence of cost of Technology on adoption of green procurement practices, to establish the influence of availability of green products on adoption of green procurement, to determine the influence of enforcement of environmental laws and policies on adoption of green procurement and to establish the influence of company management systems on adoption of green procurement. A descriptive study design from cross sectional approach were used involving both qualitative and quantitative approaches. The study took place at different manufacturing firms listed in Nairobi Securities Exchange (NSE) in Kiambu County The study adopted a survey design. The target population was 2915 employees, picked from the different firms. The study used both open and close ended questionnaires. Pilot testing was done to ensure the reliability and validity of the instrument. Quantitative data were analyzed using Statistical Packages for Social Science (SPSS version 24.0.) While qualitative data were analyzed using content analysis. Secondary data was collected from books, reports and journals Statistical quantitative data was analyzed using tables and diagrams, and inferential statistics. This means that diagrams and tables were used in the analysis. Additionally, correlation analysis was used. Lastly the researcher used regression method to further analyze data.

The findings indicate that 63% of the respondents agreed that initial cost for erecting a new technology for green procurement is high, 79% agreed that the cost of training staff on green procurement is high and 80% of the respondents agreed that the maintenance cost of green procurement technology is high. 77% agreed that green products raw materials are not available, 78% agreed that there is high level of competition for available resources and 80% agreed that substitute products are not available. The findings reveal that 74% agreed that Law enforcement agencies are active in enforcing environmental laws, 72% agreed that information on compliance is available, 83% agreed that corruption malpractices are high and 75% agreed that there is enforcement of environmental laws and policies in their organization. The findings show that 63% of the respondents agreed that they have a centralized management system, 85% agreed that they have a decentralized management system, 75% agreed that their organization has established a quality management system and 73% agreed that their organization has established a change management system.

Conclusions were made based on the results of findings of the study to guide manufacturing firms on importance of adopting green procurement thus performance and areas for further research was identified by the researcher. The study concluded that initial cost for erecting a new technology for green procurement is high, it also concluded that the maintenance cost of green procurement technology is high

The study concluded that raw materials are not available and there is high level of competition for available resources and also it concluded that substitute products are not available. The study concluded that law enforcement agencies are active in enforcing environmental laws, it also concluded that information on compliance is available, it further concluded that corruption malpractices are high. It concluded that there is enforcement of

environmental laws and policies. The study also concluded that organizations have established a quality management system and it also concluded that the organizations have established a change management system.

The researcher recommended that the organizations should actively source for funds from investors to help them with election of new technology to support green procurement. The study further recommends that supply chain should write to top management a proposal to support green procurement initiative, they should give in details the cost benefit analysis of erecting new technology that will support green procurement.

Supply chain management should source green raw materials from global suppliers, since they will be in apposition to get green products at an affordable price. The researcher further recommends that organizations should enter into long-term relationship with those suppliers of green products, in order to curb issues of intense competition when it comes to green products. Supply chain management should ensure that law governing green procurement are observed by their organizations and employees, the researcher recommends also that organizations should train their staff on any law that is enforced that touches on green procurement. Another recommendation is that the organizations should have stringent measures when it comes to fighting corruption, they should highly penalize the staff who are found getting involved in any corruption malpractices. The organization should ensure that they adopt centralized procurement systems, in order to enjoy economies of scale that come with this centralized system. The researcher further recommends an improvement in a change management system, that it should train their employees to embrace change.

1. INTRODUCTION

Background of the Study

An expanding number of organizations in Kenya and the world at large are rightly accepting corporate obligations and, specifically, environmental awareness as obligatory business objectives. In fact, as opposed to being an expensive bother, environmental projects have turned into a source of competitive equality (Hollos, Blome & Foerstl, 2012). Likewise, the significance of these environmental objectives has brought about increased significance of green procurement (Meehan &Bryde, 2011). A rising number of companies are embracing green procurement into their everyday operations across different industries.

Because of the increasing number of environmental policies and additionally sustained authenticity pressure from numerous stakeholders, an expanding number of manufacturers are participating in green practices (Rusinko, 2007). There are mainly two ways in which manufacturing companies can diminish their aggregate environmental effect: investing more in environmental technologies and by investing more in pollution prevention instead of pollution control (Lintukangas, Hallikas & Kähkönen, 2013). Curiously, numerous manufacturing companies in Kenya overwhelmingly concentrate on their production processes and distribution systems. Nonetheless, regardless of its widespread acknowledgment, companies have just as of late started to participate in green procurement that covers their suppliers and have acknowledged that coordinated action is important to tackle the sustainability question (Awasthi, Chauhan & Goyal, 2010).

In Kenya procurement as defined by the Public Procurement and Disposal Act (2005) refers to the acquisition of works, assets, goods and services either through purchasing, renting, leasing, contractual buying, and licensing, franchising, tenancy or through any other contractual method. The sustainable acquisition is accordingly the utilization of sustainable development standards in procurement affairs. Sustainable procurement is not about going "green". Sustainable procurement involves publicly and morally conscientious procuring, reducing environmental effect across the supply network, presenting cost-effective solutions and promoting beneficial business customs (CIPS - Sustainable Procurement, 2014). Sustainable procurement derives its origins from the broad idea of sustainable growth, but the emphasis of sustainable procuring is more extensive than simply the growth, it seeks to meet the varied demands of every person in current and future communities, advancing individual health, societal unity, and inclusion, and building equal opportunities (CIPS - Sustainable Procurement, 2014).

Sustainable Procurement is the quest for sustainable growth goals through the buying and supply process and comprises harmonizing environmental, communal and financial targets (Walker & Phillips, 2009). Sustainable acquisition accords appropriate contemplations to the effect of procurement on the environment, public and on the social state of persons or firms supplying and accepting the goods or services. Lately, scholars and experts are progressively becoming keen on how firms and their suppliers affect the environment, the community, and the economy. It has been propelled by the demand by companies to conform to environmental laws, manage expenses through entire lifecycle costing, controlling

supply chain threats and the requirement for these firms to have a great relationship with community (Walker & Phillips, 2009).

The strategic function of procuring and supply as a prize for sustainable growth is significantly more established now than previously. These subjects are significant to directors as their shareholders, clients, administrative bodies, nongovernmental organizations and even their workers are progressively requesting that companies address and control the environmental and social matters that are affected by their companies (Carter & Liane, 2011). Procuring chiefs are more pertinently situated here because they can affect the social and environmental execution, through for instance goods and services description, assessment and supplier selection, and assessing execution of the supplier either by establishing the performance assessment criteria or utilizing that criterion to assess the suppliers' fulfillment of the agreement for which the goods are supplied against.

2. STATEMENT OF THE PROBLEM

The benefits of adoption of green procurement cannot be over emphasized. They include for example resource waste reduction, improved efficiency, improved company reputation, hazardous material management costs, reduced operational costs, reduced repair and replacement costs, reduced disposal costs and health and safety costs. It is because of these benefits that NEMA has been emphasizing on adoption of green procurement in Kenya.

Despite these known benefits of adoption of green procurement, however many companies in Kenya have not adopted it. In order to address the challenges which are hindering them to adopt, it would be necessary to know why they are not adopting. This is what this study is addressing.

Researchers on this area for example Gatari and Were (2014) who carried out a research at Unga Limited concluded that there were no organizational and structural changes to facilitate implementation of green procurement. The study also found out that there was poor regulatory and legal framework, the price of green procurement is quite high and the resources essential in implementing green procurement are inadequate in the manufacturing sector. Lozano (2013) suggested that before a green procurement program can be implemented, current purchasing practices and policies must be reviewed and assessed.

Goh C. and Suhaiza Zailani (2010) also conducted an investigation on Green Supply Chain Initiatives in the Context of SMEs in Malaysia, they found out the key barrier in adopting green supply chain initiative, including attitudinal and perceptions barrier, information related barrier, technical barrier, resource barrier and business strategic orientation.

Nasiche (2014) and Ngugi (2014) are also examples of researchers who have investigated on sustainable procurement in Kenya. The Scholars indicate that although green procurement would help control a number of evils such as global warming and climate change, not all manufacturing companies have taken up to the idea of accepting sustainable procurement.

Despite efforts from NEMA (National Environmental Management Authority) to control industrial wastes in major towns in Kenya, there has been a lot of water pollution in river catchment areas in Ruiru dam, and this has affected the community because some of them have had major health related complications e.g. lead poisoning, helminthic infections, diarrhea, and cholera are the major diseases affecting the society as a result of the effluents discharged by these companies (Tibaijuka, 2007).

This research therefore was aimed at determining the factors influencing adoption of green procurement practices by manufacturing firms in Kenya. The research was focused on Kiambu County.

General Objective

To investigate the factors influencing adoption of green procurement practices by manufacturing firms in Kenya: A survey of Kiambu County.

Specific Objectives

1. To establish the influence of cost of technology on adoption of green procurement practices by manufacturing firms in Kiambu County.

2. To examine the influence of availability of green products on adoption of green procurement practices by manufacturing firms in Kiambu County.

3. RESEARCH DESIGN

Research design is the arrangement of conditions for collection and analysis of data. As Kothari (2004) pointed out, it constitutes the blue print for the collection, processing and analysis of data. The research design for this study used a descriptive research study from a cross sectional approach.

Descriptive research includes surveys and fact finding enquiries which define a subject often by creating a profile of a group of problems, people, or events, through the collection of data and the tabulation of frequencies on research variables or their interaction (Cooper & Schindler, 2014). Further, Wolverton (2009) defines survey as a method of collecting data from people about who they are, how they think (motivations and beliefs) and what they do (behaviour). A cross sectional survey research design was employed with data being collected at one point in time.

As advanced by Zikmund, Carr, Babin and Griffin (2013), the research design employed in this study used both quantitative and qualitative (involve the use of empirical assessments that involve numerical measurements and analysis for example, the use of questionnaires to collect information and qualitative (aims to achieve an in-depth understanding of a situation (seeking to extract feelings, emotions, motivations, perceptions, consumer language or self-described behavior

4. DATA ANALYSIS

4.1 Inferential Statistics:

Reliability Analysis

The variables, Cost of Technology, Availability of Green products, Enforcement of environmental laws and policies, Company management systems and Adoption of Green Procurement scale reliability was determined by computing the overall Cronbach's alpha reliability coefficient for the items contained in each variables. Results presented in table 4.1 indicate that all the variables attained the acceptable and recommended level of alpha 0.70 (where the overall Cronbach's alpha statistic for Cost of Technology, Availability of Green products, Enforcement of environmental laws and policies, Company management systems and Adoption of Green Procurement was 0.7889, 0.7661, 0.8108, 0.7373 and 0.8761 respectively). The reliability of the instrument stands at approximately 87.21%.

Table 4.1 Reliability of the study Variables

Variables	Cronbach's Alpha	Number of items
Availability of Green products	0.7661	3
Cost of Technology	0.7889	3

4.2 Normality test

The test for normality was made by estimating measures of shape including skewness and kurtosis presented in Table 4.2. The rule of thumb is that a variable is reasonably close to normal if its skewness and kurtosis have values between -1.0 and + 1.0 Myoung, 2008. Normality of the variables is shown in Table 4.2 below indicated that the values of skewness and kurtosis was between the range of -1.0 and + 1.0. This implies that the assumption of normality was satisfied.

Table 4.2 Normality Test

Variables	N	Skewness		Kurtosis		conclusion
		Statistic	Std. Error	Statistic	Std. Error	
Availability of Green products	186	-.638	.178	.821	.355	Normally Distributed
Cost of Technology	186	.664	.178	.304	.355	Normally Distributed

4.3 Correlation Analysis

Cost of Technology was found to be negative and significantly related to Adoption of Green Procurement (r = -0.295, p-value=0.000<0.05). Availability of Green products was found to be positive and significantly related to Adoption of Green Procurement (r = 0.466, p-value=0.000<0.05 as indicted in table 4.3.

Table 4.3 Correlation Analysis

Variable	Statistic	Cost of Technology	Availability of Green products
Adoption of Green Procurement	Pearson Correlation	-.295**	.466**
	Sig. (2-tailed)	.000	.000
	N	186	186

**. Correlation is significant at the 0.05 level (2-tailed).

Negative (-) correlation denotes that variables are varying in opposite direction that is; one variable is increasing as the other id decreasing and vice versa.

Positive (+) correlation denotes that variables are varying in the same direction that is; as one variable is increasing the other is also increasing.

From the results it implies that;

i) As cost of technology increases, adoption of green procurement reduces (negative correlation)
ii) As availability of green products increases, adoption of green procurement increases (positive correlation)

4.4 Regression Analysis

The independent variables Cost of Technology, Availability of Green products, Enforcement of environmental laws and policies, Company management systems) were regressed on dependent variable adoption of Green Procurement. The R square statistic amounted 0.453 which clearly suggests that there is a strong relationship between Cost of Technology, Availability of Green products, Enforcement of environmental laws and policies, Company management systems and adoption of Green Procurement as indicated in table 4.4 This implies that Cost of Technology, Availability of Green products, Enforcement of environmental laws and policies, Company management systems share a variation of 45.3 % of adoption of Green Procurement.

Table 4.4 Model Summary[b]

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.673[a]	.453	.441	.75557

a. Predictors: (Constant), Cost of Technology , Availability of Green products, Enforcement of environmental laws and policies, Company management systems

b. Dependent Variable: Adoption of Green Procurement

R^2 indicates the extent to which a model explains the variability in the dependent variable. In this case, R^2 =0.453 = 45.3%. this means that the regression model explains 45.3% of the variability in y/ dependent variable/ adoption of green procurement.

Adjusted R^2 shows the goodness/fitness of a model given several variables in a model. The more the non- significant variables in a model the higher the gap between R^2 and adjusted R^2. In this case, R^2 =0.453 and adjusted R^2= 0.441, therefore the gap is not big hence the four variables in the model are significant.

R=Correlation = 0.673. R measures the degree of relationship between predictor variables (independent variables) and the response variable (dependent variable). In this case it denotes a high positive (+) correlation.

Table 4.5 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.544	4	21.386	37.461	.000^b
	Residual	103.330	181	.571		
	Total	188.874	185			

a. Dependent Variable: Adoption of Green Procurement

b. Predictors: (Constant), Cost of Technology , Availability of Green products, Enforcement of environmental laws and policies, Company management systems

The Anova table in table 4.5 indicates that the overall model was a good fit since (F-value=37.461 and p-value=0.000<0.05).

Unlike T-tests that only access one regression coefficient at a time, F-test assesses multiple coefficients in a model significantly. In this case, significance =0.000= P value and therefore P value =0.000 < 0.05 hence the conclusion that the model is significantly fit.

Table 4.6 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.128	.055		2.305	.022
	Cost of Technology	-.174	.056	-.202	-3.126	.002
	Availability of Green products	.194	.063	.214	3.084	.002

a. Dependent Variable: Adoption of Green Procurement

T test is used to test the statistical significance of each parameter/ independent variable in the model. P value =0.02<0.05 hence reject the null hypotheses (H_0) and conclude that cost of technology is significantly different from zero at 5% level of significance.

The model becomes

$$Adoption = 0.128 - 0.174_{cost} + 0.194_{greenproducts} + \varepsilon$$

5. INTERPRETATION OF OVERALL MODEL

Cost of Technology on Adoption of Green Procurement

Cost of Technology was found to have a negative linearly significant influence on adoption of Green Procurement. (β=-0.174, T=-3.126, p<0.05). Here one-unit increase in Cost of Technology results in 0.174-unit decrease in adoption of Green Procurement holding other factors constant.

Availability of Green products on Adoption of Green Procurement

Availability of Green products was found to have a positive linearly significant influence on adoption of Green Procurement. (β=0.194, T=3.084, p<0.05). Here one-unit increase in Availability of Green products results in 0.194-unit increase in adoption of Green Procurement holding other factors constant.

Predictive Importance

The beta coefficients indicate the relative importance of each independent variable (Cost of Technology, Availability of Green products,) Availability of green products is the most significant (βeta=0.318) in influencing the dependent variable (Adoption of Green Procurement) (βeta=0.214) and the least is Cost of Technology (βeta=-0.202).

Adoption of green procurement is predicted to be at 0.128 units (B_0) when all other predictor variables are held constant.

6. CONCLUSION

The study concluded that initial cost for erecting a new technology for green procurement is high, it also concluded that the maintenance cost of green procurement technology is high.

The study concluded that raw materials are not available, it also concluded that there is high level of competition for available resources and also it concluded that substitute products are not available

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