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Influence of Regulatory Demand on Adoption of Green Procurement Strategy in Manufacturing Firms in Nakuru County, Kenya

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Abstract: **Green procurement strategy leads to efficient production at lowest possible cost. For instance adoption of Green procurement strategy has led to minimization of production cost by up to 15%. Locally, though green procurement strategy has been investigated, there is limited empirical data on cross sectional studies that cut through various sectors such as those in the manufacturing industry. The aim of this study therefore was to find the determinants of adoption of green procurement strategy in manufacturing firms in Nakuru County, Kenya. The study specifically attempted to establish the influence of regulatory demand on adoption of green procurement strategy in manufacturing in Nakuru County, Kenya.**

The study was anchored on two theories, namely: Systems Theory, Agency theory. The target population was 3 procurement staff of 34 manufacturing firms in Nakuru County, Kenya all totaling 102 staff. Purposive sampling was used to identify procurement staff in each of the 34 manufacturing firms.research design used was descriptive Data was collected using closed-ended questionnaire after which they were pretested to ensure validity and reliability.finally Data summary was done using both descriptive and inferential statistics and then presented in tables.

Keywords: **Regulatory Demand And Green Procurement Strategy.**

I. INTRODUCTION

Over the years there has been a repeat of events such as the energy crisis and prevailing consumerist behavior which encourages high demand especially for raw materials by individuals and organizations alike.

Recent studies in Kenya on green or sustainable supply chains reveal that it is becoming increasingly important for firms to re-focus their business strategy to include green supply chain strategy. Barasa, Namusonge and Iravo (2015) posited that manufacturing companies in developing countries in which Kenya is included are now increasingly taking green procurement strategies in their business operations to ensure favourable competition globally. Sachan and Datta (2005) found there were very few factors influencing change to green procurement strategy publications on developing and under developed countries.public sector firms have also responded to green procurement practices and more are still getting involved and joining the rest .these practices are renewable energy ,recycled office papers etc.The former rift valley province, is well endowed with agricultural and tourism resources which have attracted several manufacturing firms. According to Kenya association of manufacturers (KAM, 2017), there are 13 registered manufacturing firms. These are classified as large, medium and small scale manufacturing firms according to annual average turnovers made. The KAM defines small scale manufacturers as those manufacturing firms with a turnover of between ten million and twenty million Kenya shillings. The manufacturing firms according to KAM are provided in appendix III. Though KAM classifies manufacturing firms according to their product type, the study will treat all firms as independent units that have adopted green procurement strategy.

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Statement of the Problem

Firms are facing pressure due to environmental degradation . these leads to the change in whole supply chain that is from acquisition of raw materials up to their delivery so that it can be as green as possible .hence lead to reduction of waste generation ,reuse and recycling . however most firms have not adopted the green procurement despite efforts and numerous significance like , i**ncreased shareholder value, cost reduction, reduced risk** and c**ustomer satisfaction (Muma, Nyaoga, Matwere & Nyabega (2014)). This** has led to the need to research on the determinants of adoption of green procurement strategy in manufacturing firms in Nakuru County. Green procurement strategy (GPS) can lead to maximization of output and reduction of inputs as see globally e.g in the united states. Similarly the increased adoption of Green procurement strategy in European countries has had significant effect on organization production costs. In Kenya, though green procurement strategy has been investigated, there is limited empirical data on cross sectional studies that cut through various sectors such as those in the manufacturing industry. Furthermore, the few studies show conflicting findings on the determinants of adoption of GPS. This begs the questions: Do regulatory demand influence adoption of GPS? In what way do customer pressures and perceived benefits influence adoption of GPS? This study aims to fill this knowledge gap.

1. Objective of the Study

To determine the influence of regulatory demand on green procurement strategy in manufacturing firms in Nakuru County, Kenya.

2. *Research Hypotheses*

Ho: Regulatory demand has no significant influence on adoption of green procurement strategy in manufacturing firms in Nakuru County, Kenya.

II. LITERATURE REVIEW

1. Theoretical Review

Agency Theory: Agency relationship can be defined as a contract which involves one or more persons getting engaged with another agent to offer some service on their behalf.. the agent act honestly since the chosen decision has repercussions for both parties.This concept assumes that the principal and agent have different levels of information, and as such, the agent can exploit a situation.This theory is most important in contracting various functions in organization where the firm engages a third party to offer certain services to the firm.Whenever there is substantial conflict of interest between principals and agents Situations arise which include insufficient outcome certainty that trigger the risk implications of the theory.when staff have conflict of interest adoption of green procurement is affected .

. The theory is used to explain customer pressures on the manufacturing firm as it attempts to satisfy customer needs, the organization (profits) , customers (better products and services at lower cost) creates an agency problem. And conflicting outcomes for employees (rewards),

Systems Theory: Systems theory describes the interdependence of departments in an organization and how a variation in one area can change the other section .firms interacts with external environment and the firm maintains a state of balance by adapting to the changes .organizations are viewed as one system and all parts are equally important .organisations are not closed systems and interacts with their environment .they are in moving equilibrium as the correspond to changes in the environment accordingly .the theory views organisation structure as identified pattern of relationship among sections . different themes are the formalized policies, procedures, and controls that guide the organization , authority systems , differentiation and integration (the way activities are coordinated.organisations are open systems which depend on environment to thrive well .therefore the organization structure and environment is especially very important .

2. Empirical Review

A. Empirical Review

Regulatory demand:it is the capacity to which regulators hinder company's operations .they make manufacturers comply with environmental laws and suffer consequences financially for the degradation of environment . Kenya was part of various environmentl laws such as EMCA 199 ,waste management regulation(2006) etc which makes all the organizations to adhere to it .Environmental compliance enables proper utilization of resources for sustainable

development in Kenya.(GOK 2006).adoption of green economic approaches is taking place in various countries including Kenya introducing natural resource utilization in 2010 constitution .the research assessed three types of responding to change of the green strategy as intergrative , passive green and reactive strategy which is related to compliance and non compliance plan whose goal is reacting to external pressures which will result to environmental protection . Similarly, variables such as rules , social responsibility, expected business gains and customer requirements led to greening of supply chains through supply chain initiatives towards environmental sustainability.Firms in a country are expected to follow the environmental policies so as not to be in conflict with the state as green supply chain strategy practice is likely to be the factor of ensuring their continuity and also to ensure they are rewarded and given incetive .Those firms inventing green strategies are awarded by the responsibe governments so as to encourage the others to do so.Most of raw materials are imported in Kenya . this is a very big challence as even the raw materials we own are controlled by the multinationals .some countries which use green production method they donot support green supply chain but they are responding to external pressure .Most of manufacturing firm takes permit not because environment conservation is part of their strategic plan but just as a formality to comply with the law . currently in Kenya most companies are subjected to audit and environment impact assessment .Fuel handling firms are exposed to assessment from extraction to disposal.The government is now making it a compulsory to use cleaner energy sources such as solar energy. (GOK 2014)

Green procurement : originates from processes aimed at preventing pollution. green procurement services are applicable to all organiztions at all levels .the green procurement programme is more involved in setting environmental requirements for contractors and suppliers..green services and products economizes resources maiking them last longer and minimize their impacts .green products have high safety standards and less impacts on human health .before implementing green procument program current purchasing habits and guidelines must be reviewed . Determination of environmental effect of products is necessary and environmental procures against which contract and purchase decisions are made has to be generated. The result is a consistently reviewed green purchasing guideline that is incorporated into other organizational plans, programs, and policies. A green purchasing policy includes accountability and delegation of responsibilities, a communication and promotion plan and date-stamped priorities and targets. Green procurement rules and regulation can increase resource efficiency; influence production, markets, prices, available services and organizational behavior and minimize expenditure and waste. setbacks to the success of executing green procurement include : undocumented environmental claims by suppliers and manufacturers , inadequate organizational support , absence of readily available environmental friendly products and misleading studies. States are discouraging firms to going against green and have been creating laws and providing with incentives for their initiatives. As reported by Morrison (Morrison, 1991) in one of his studies, 70% of the organizations have specific allocations made to tackle this issue. Still many organizations consider this from a corporate reputation and they do it just as a requirement. Environmental issues have been the main reason of sustainable procurement. The reduction of carbon emission ozone depletion, alternate energy sources to effectively use the natural sources, bio-degradable materials, eco-friendly products, have all been important factors. Socio-economic development of the local, like the social welfare of people, health care, employment opportunities also form the core of sustainable procurement.

III. METHODOLOGY

1. Research Design ,Target Population And Sampling

The study employed survey design. The method permits gathering of data from the respondents in natural settings (Mugenda & Mugenda, 2010). Survey designs result in a description of the data, whether in words, pictures, charts, or tables, and whether the data analysis shows statistical relationships or is merely descriptive. The target population for this study comprised procurement staff in the 34 manufacturing firms registered with KAM in Nakuru County, Kenya. The target population therefore comprised 3 procurement staff in each of the 34 firms in the county thus totaling 102 procurement staff. . Since the target population of 102 procurement staff was fairly small, the study undertook a census approach and thus all the 102 procurement staff will form the sample . Purposive sampling was used in targeting the said procurement staff in each of the manufacturing firms.

2. Research Instruments and data collection and analysis

The study used questionnaire survey to collect the primary data.. The survey questionnaire allows data from both sampled groups to be collected in a quick and efficient manner. The use of survey questionnaire makes it possible for descriptive and inferential statistical analysis (Saunders & Lewis, 2009).. The data needed for a study will be collected

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either as secondary data or as primary data. Cooper and Schindler (2005), define primary data to be data collected at source whereas secondary data is data which already exists. Primary data can be both qualitative and quantitative using both closed and open ended questions. The primary data was sourced from the answers the participants gave during the survey process. Before embarking on data collection, permission to collect data was sought from the National Council for Science, Technology and innovation (NACOSTI). The researcher also sought clearance from both the university and the relevant manufacturing firm.According to Cooper and Schindler (2005), In the study, the validity of the questionnaires was to be observed by adhering to the characteristics of self-evident measures. These measures demonstrated the extent to which the instruments measure what they are supposed to measure, which is classified as face and content validity. Thus, in order to ensure face validity, the questionnaires will be subjectively assessed for presentation and the relevance of the questions. To increase validity of the instruments, the researcher sought expert judgment and guidance from the University supervisor, who provided insights which were relevant in ensuring content, construct and face validity of the instruments. A questionnaire with a high reliability would receive similar answers if it is done again or by other researchers (Cooper & Schindler, 2005). The reliability of the questionnaires will be determined through the Cronbach alpha method. Cronbach alpha provides a good measure of reliability because holding other factors constant the more similar the test content and conditions of administration are, the greater the internal consistency and reliability. Fraenkel and Wallen (2006) have recommended that reliability test which produces Cronbach alpha (α) values of greater than 0.70 is sufficient in making the questionnaires reliable. The data collected from the questionnaires was analyzed using both descriptive (means and standard deviations) and inferential statistics (correlation and regression) with Statistical Package for Social Sciences (SPSS) version 21.0. The results of the survey were presented in tables. For the purpose of analyzing the relationships of each of the independent variable on the dependent variable, the study used the F-test to test both the effect of each variable and the overall effect of the independent variables on the dependent variable using the proposed functional relationship:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Adoption of Green Procurement Strategy, X_1 = Regulatory Demand, X_2 = Customer Pressures,X_3 = Internal Stakeholders Demand,X_4 = Perceived Benefits,β_0,β_1, β_2, $\beta_3$and β_4 = Beta Coefficients ,ε = Error Term

$Y = \beta_0 + \beta_1 X_1 + + \varepsilon$…….. (i)

Where;

Y= Supply Chain Performance of Agro-Based Processing Firms, β_0 =constant,$\beta_1 + \beta_3$ = weights crested from the variables (x_1,x_2,x_3) as shown below,X_1 = Product Return Rates,X_2 = Decisions on Product Recovery,X_3 = Product End-of-Life ManagementmX$_3$ = Product Reversal Contingencies, ε is the estimated error of the model that has a mean of zero at constant Variance

IV. RESULTS AND DISCUSSIONS

1. Response Rate and reliability test

The researcher issued 102 questionnaires. Out of 102 questionnaires that were issued, 86 of them were filled and returned. Of the returned questionnaires, 6 were incorrectly filled and thus were not used in the final analysis. Therefore, 80 were correctly filled and hence were used for analysis representing a response rate of 78.4%. Various studies such as those of Ngugi (2016) indicate that getting a high response rate from a small random sample is considered preferable to a low response rate from a large sample and thus is an important element in proving the statistical significance of the responses. Therefore, the response rate was considered sufficient to enable further analysis. Fraenkel and Wallen (2006) have recommended that reliability test which produces Cronbach alpha (α) values of greater than 0.70 is sufficient in making the questionnaires reliable.

2. Demographic analysis

Majority of the respondents were male (52.5%) while the female respondents were 47.5%. The study attributed this trend to the existing gender gap in both the public and private sectors in Kenya. The result also indicated majority of the respondents were of the age group 31 – 40 years (36.3%) while the least age group was below 21 years (1.3%).also

majority of the respondents (47.5%) had a degree level qualification. Further, over 66% of the respondents had either a bachelors or masters degree. Most of the respondents (42.5%) had over 10 years working experience. Cumulatively, more than 68% had more than 5 years of experience while only 10% had less than 1year working experience.

3. **Regulatory Demands and Adoption of Green Procurement Strategy**

From the findings majority of the respondents (60%) agree that their firm adopted green procurement strategy due to demands to comply with various acts of parliament while only 16.3% disagree. Similarly, majority (56.3%) agree that they adopted green procurement strategy due to fear of loss or closure of business due to new regulatory policies while only 11.3% disagree. Further, majority of respondents (75%) agreed that their firm adopted green procurement strategy due to the fear of trade barriers and international certification for our products while only 4% disagreed.76.3% of the respondents agreed that their firm has adopted green procurement strategy due to pressure from environmental regulators while only 6.3% disagreed. Further, 57.5% agreed that they adopted green procurement due to pressure to comply with annual environmental audits and perpetual government inspections while 25% disagreed. Finally, 57.6% of the respondents agreed that their firm adopted green procurement strategy to gain competitive advantage while only 22.5% of the respondents disagreed.

Table 1: Regulatory Demands and Adoption of Green Procurement Strategy

	SD	D	N	A	SA	Mean	Std Dev
Our firm adopted green procurement strategy due to demands to comply with various acts of parliament	2 (2.5%)	11 (13.8%)	19 (23.8%)	22 (27.5%)	26 (32.5%)	3.74	1.133
We adopted green procurement strategy due to fear of loss or closure of business due to new regulatory policies	2 (2.5%)	7 (8.8%)	26 (32.5%)	26 (32.5%)	19 (23.8%)	3.66	1.018
Our firm adopted green procurement strategy due to the fear of trade barriers and international certification for our products	0 (0%)	4 (5%)	16 (20%)	22 (27.5%)	38 (47.5%)	4.17	.925
Our firm has adopted green procurement strategy due to pressure from environmental regulators	1 (1.3%)	4 (5%)	14 (17.5%)	27 (33.8%)	34 (42.5%)	4.11	.955
We adopted green procurement due to pressure to comply with annual environmental audits and perpetual government inspections	10 (12.5%)	10 (12.5%)	22 (27.5%)	24 (30%)	14 (17.5%)	3.28	1.103
Our firm adopted green procurement strategy to gain competitive advantage	6 (7.5%)	12 (15%)	16 (20%)	27 (33.8%)	19 (23.8%)	3.51	0.992
Valid N (listwise)	80						

The study further analyzed the means and standard deviations of the findings in each of the propositions and the results are as shown in Table 1. From the findings, majority of the respondents agreed that their firm adopted green procurement strategy due to demands to comply with various acts of parliament (mean=3.74), that they adopted green procurement strategy due to fear of loss or closure of business due to new regulatory policies (mean=3.66), that their firm adopted green procurement strategy due to the fear of trade barriers and international certification for our products (mean=4.17), that their firm has adopted green procurement strategy due to pressure from environmental regulators (mean=4.11) and that their firm adopted green procurement strategy to gain competitive advantage (mean=3.51). The respondents were however unsure when asked whether they adopted green procurement due to pressure to comply with annual environmental audits and perpetual government inspections (mean=3.28).

Measurement of Adoption of Green Procurement Strategy:

The findings in this section involve the measurement of the dependent variable and are shown in Table 4.9. From the findings, 87.5% agreed that their firm has drastically reduced hazardous elements in their manufacturing process while 2.6% disagreed. 78.8% agreed that they had implemented design for environment practices in product development and to reduce, or recycle manufacturing waste while 5% disagreed. 68.8% agreed that their firm has invested in the use of

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renewable energy sources in their manufacturing process while 7.5% disagreed.82.3% agreed that their firm uses the green criteria in technical specifications for our suppliers while 8.8% disagreed. 71.3% agreed that they were been able to reduce energy consumption in their manufacturing processes while 7.6% disagreed. 71.3% agreed that the green procurement strategy has been impeded in their manufacturing and environmental policies. 72.6% agreed that their firm actively participates in campaigns for green products, processes and activities while 8.8% disagreed.

Table 2: Measurement of Adoption of Green Procurement Strategy

	SD	D	N	A	SA	Mean	Std Dev
Our firm has drastically reduced hazardous elements in our manufacturing process	1 (1.3%)	1 (1.3%)	8 (10%)	42 (52.5%)	.28 (35%)	4.19	.765
We have implemented design for environment practices in product development and to reduce, or recycle manufacturing waste	2 (2.5%)	2 (2.5%)	13 (16.3%)	44 (55%)	19 (23.8%)	3.95	.855
Our firm has invested in the use of renewable energy sources in our manufacturing process	2 (2.5%)	4 (5%)	19 (23.8%)	35 (43.8%)	20 (25%)	3.84	.947
Our firm uses the green criteria in technical specifications for our suppliers.	2 (2.5%)	2 (2.5%)	18 (22.5%)	37 (46.3%)	21 (36.3%)	3.91	.903
We have been able to reduce energy consumption in our manufacturing processes	2 (2.5%)	5 (6.3%)	16 (20%)	37 (46.3%)	20 (25%)	3.85	.956
The green procurement strategy has been impeded in our manufacturing and environmental policies	3 (3.8%)	3 (3.8%)	17 (21.3%)	28 (35%)	29 (36.3%)	3.96	1.037
Our firm actively participates in campaigns for green products, processes and activities	1 (1.3%)	6 (7.5%)	15 (18.8%)	33 (41.3%)	25 (31.3%)	3.94	.959
Valid N (listwise)	80						

Furthermore, from the findings, majority of the respondents agreed that firm has drastically reduced hazardous elements in our manufacturing process (4.19), that they have implemented design for environment practices in product development and to reduce, or recycle manufacturing waste (3.95), that their firm has invested in the use of renewable energy sources in our manufacturing process (3.84), that their firm uses the green criteria in technical specifications for their suppliers (3.91), that they have been able to reduce energy consumption in their manufacturing processes (3.85), that the green procurement strategy has been impeded in their manufacturing and environmental policies (3.96) and that their firm actively participates in campaigns for green products, processes and activitiesm.

4. Correlation Analysis

Regulatory Demands and Adoption of Green Procurement Strategy

The respondents' ratings in the statements related to regulatory demands were cumulated to obtain a composite score for regulatory demands. The total scores were then used to compute the Pearson's correlation coefficient to establish the nature and strength of the correlation between regulatory demands and adoption of green procurement strategy. The findings of the correlation analysis were as shown in Table 3

Table 3: Regulatory Demands and Adoption of Green Procurement Strategy

		Adoption of Green Procurement Strategy	Regulatory Demands
Adoption of Green Procurement Strategy	Pearson Correlation	1	.340**
	Sig. (2-tailed)		.002
	N	80	80

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

5. Regression Analysis

The study carried out a regression analysis to establish the influence of regulatory demands, customer pressures, perceived benefits and internal stakeholders' demands on adoption of green procurement strategy. The model summary is depicted in Table 4

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Table 4.: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.795[a]	.632	.612	.32011

a. Predictors: (Constant), regulatory demands,

The R^2, the coefficient of determination shows variability in dependent variable explained by the variability in independent variables. This value tells us how adoption of green procurement strategy can be explained by regulatory demands, customer pressures, perceived benefits and internal stakeholders' demands. The R^2 value of 0.632 implies that 63.2% of the variations in adoption of green procurement strategy can be explained by the variations in independent variables. This therefore means that other factors not studied in this study contribute 36.8% of adoption of green procurement strategy.

Table 5: Summary of ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	189.856	4	47.464	8.447	.000[b]
Residual	443.894	79	5.619		
Total	633.750	83			

a. Dependent Variable: regulatory demands .

b. Predictors: (Constant), adoption of green procurement strategy

Linear Regression Analysis

The researcher further conducted a linear regression analysis and the findings of the multiple regression model is depicted in Table 5. From the linear regression model, holding the independent variables constant, adoption of green procurement strategy would increase by 0.877. It was established that a unit increase in regulatory demands would cause a decrease in adoption of green procurement strategy by a factor of 0.145

Table 6: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	SE	B	t	p
Constant	.877	.310		3.062	.003
Regulatory Demands	-.145	.075	-.049	-1.604	.058

a. Dependent Variable: Adoption of Green Procurement Strategy

It was established that both internal stakeholders demand and customer pressures had the most influence while regulatory had the least influence on adoption of green procurement strategy. The un-standardized beta coefficients in Table above were then used to obtain the overall relationship of the independent variables and the dependent variable and model was formulated as:

$Y = 0.877 - 0.145X_1$

Where Y = Adoption of Green Procurement Strategy, X_1 = Regulatory Demands,

It can be deduced from the findings in Table 6 that, regulatory was not significant in the model ($\beta = 0.055$, $p = 0.522$).

The study therefore establishes that regulatory demands , influence the adoption of green procurement strategy in agro-based processing firms in Nakuru County.

6. Hypothesis Tests

$H_{01:}$ From the one-way ANOVA results, since $F_{Calculated}(1.115) < F_{Critical}(1.8256)$, we fail to reject the null hypothesis and conclude that at 5% significance level, regulatory demand has no significant influence on adoption of green procurement strategy in manufacturing firms**.**

V. CONCLUSION

1. Conclusion

The study established that manufacturing firms adopted green procurement strategy due to demands to comply with various acts of parliament (mean=3.74), that they adopted green procurement strategy due to fear of loss or closure of business due to new regulatory policies (mean=3.66), that they adopted green procurement strategy due to the fear of trade barriers and international certification for our products (mean=4.17), that adopted green procurement strategy due to pressure from environmental regulators (mean=4.11) and that adopted green procurement strategy to gain competitive advantage (mean=3.51). From correlation analysis, it was established that there was a weak positive relationship between regulatory demands and adoption of green procurement strategy (r = 0.340). Although the correlation was weak in strength, the positive nature of the relationship implies that higher levels of adoption of green procurement strategy can be associated with how the said firms are able to enhance implementation of regulatory demands. From the regression analysis, the study established that a unit increase in regulatory demands would cause a decrease in adoption of green procurement strategy by a factor of 0.145**.**

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