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Determinants Of Adoption Of Green Supply Chain Management Practices In Selected Manufacturing Firms In Eldoret Town, Kenya

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Abstract: ***Due to the current global environmental issues, Green Supply Chain Management (GSCM) provides a solution to reduce the effects of depleting the environment which has already been tampered with severely, for instance, the global warming. There has been little information about the adoption of GSCM practices in manufacturing firms in Kenya. This study assessed the adoption of GSCM in selected manufacturing firms in Eldoret town. The objectives of this study were to: evaluate the effects of government regulations and policies on GSCM adoption in selected manufacturing firms and to assess the influence of competitors on adoption of GSCM in selected manufacturing firms. The study adopted Institutional theory and a quantitative methodology was used. Methods of data collection were structured questionnaires to collect primary data and Documentary reviews to collect secondary data. Stratified random sampling was applied as a sampling technique in the study. The study used a sample size of 226 employees comprising the management team and other employees from the four selected manufacturing firms in Eldoret town. Data was analyzed using Descriptive statistics where data was arranged into a more interpretable form (frequency distributions and graphical displays). Inferential statistical analysis (Multiple regressions) was adopted to estimate parameters through interval estimate and testing of hypothesis. In relation to influence of government regulations and policies on GSCM adoption, the study finding was that the Government has initiated GSCM regulations for firms with result of*** $\beta = 0.311$ ***value at*** $P < 0.05$***. Regarding competitors' influences on GSCM adoption, the main finding was that GSCM is used as a tool for competition in the industry, the result was*** $\beta = 0.457$ ***value at*** $P < 0.05$***. This implies that the study rejected the hypotheses; hence, the hypotheses were false. From the findings of the study, it was concluded that the government has set up regulations and policies governing GSCM adoption for firms and established agencies/authorities to enforce GSCM. Furthermore, most of the selected firms comply with government policies on GSCM and there was evidence that GSCM is used as a tool for competition in the industry. There was evidence of Institutional theory used supporting the findings through coercive, mimetic and normative drivers. The study recommended that government should promote the "green" industry projects and the top management should commit to complete environmental policies, encourage employees to learn "green" knowledge as well as customers. The study suggests that a study should be done focusing on consumers' demand and the influence of organizational culture and adoption of GSCM and a longitudinal study should be taken in manufacturing firms in Eldoret town.***

I. INTRODUCTION

With increasing awareness of environmental protection worldwide, the green trend of conserving the Earth's resources and protecting the environment is overwhelming, thereby exerting pressure on corporations in Taiwan. The pressure and drive accompanying globalization has prompted enterprises to improve their environmental performance (Zhu & Sarkis, 2006). The pressure on corporations to improve their environmental performances comes from globalization rather than localization (Sarkis & Tamarkin, 2005). Increasing environmental concern has gradually become part of the

overall corporation culture and, in turn, has helped to re – engineer the strategies of corporations (Madu, *et al*., 2002).

The energy consumption in the world, particularly in the industrialized countries, has been growing at an alarming rate. Moreover, the pollution hazard arising out of fossil fuel burning has become quite significant in recent years. About 86 % of the world's energy supply comes from the fossil fuels (Aurora, 2007). The resources are, therefore, fast deflating due to excessive exploitation in an attempt to meet the ever increasing demand. Consequently the price continuously rises over the years, thereby causing hardship in addition to increased greenhouse gas emissions which lead to an irreversible damage to natural habitat (Bello & Dillip, 2011).

In Europe and North America, reverse logistics is a significant driver which is regulated to since it creates value added products for reducing costs and environmental impact of the product life cycle. Routroy (2009) mentioned that the benefits of reverse logistics are not only economic benefits, bus also environment benefit. In Germany, all employees at Siemens receive some environmental training, with a focus on those involved with the treatment of hazardous waste/dangerous substances and interested specialists (North & Daig, 1996).

Thailand has set up strategies for industrial development to promote the growth and development of industries by launching a Green Industry Project. Companies who enroll in this project will be certified and evaluated about green considerations in their organizations. As a result, these industries will have a good image of credibility and public trust. Moreover, the creation of a green economy will result in higher gross domestic product (Green Industry Project, 2014).

Kenya like other countries in the world through National Environmental Management Authority (NEMA) has been implementing sustainable development and embracing eco-friendly technologies. In order to enhance efficiency in the use of natural resources and energy, the industrial sector has embraced cleaner production technologies through technical assistance by the Kenya National Cleaner Production Centre. The Centre has build capacity of industries in improving efficiency in the status of production systems/equipments in order to reduce wastage of raw materials and energy aimed at minimizing waste generation at source. In Kenya, green initiatives are spread across public and private sectors of the economy. It is, therefore, important that green economy be embraced at all levels aimed at reducing individual carbon foot prints in order to uphold sustainability (NEMA, 2012).

II. PROBLEM STATEMENT

GSCM provides a solution to reduce the effects of depleting the environment which has already been tampered with severely, for instance, the global warming. This has become a global wake-up call driving companies to produce more environmentally-friendly image of products, process, systems and technologies, and how the business is conducted (Vachon & Klassen, 2006). Today, most organizations have realized the greater benefit of the green technology adoption in business operation (Ninlawan *et al.*, 2011). GSCM is emerging as a new systematic environmental approach in supply chain management and has been increasingly accepted and practices by forward-thinking organization (Zhu, & Sarkis, 2004).

Manufacturing firms all over the world are faced with environmental issues as they operate their core businesses. The world's 18 major fisheries already have reached or exceeded maximum sustained yield levels (Brown & Kane, 1994). If current consumption rates continue, all virgin tropical forests will be gone within 50 years and loss of 50 percent or more of the world's species (Wilson, 1989). Reduced quality of life in the developed world, severe human health problems, and environmentally induced political upheaval in the developing world could all result into turmoil (Homer-Dixon, Boutwel & Rathjens, 1993; Kaplan, 1994).

Urgent action must be taken to save the environment, which determines human lives by adopting GSCM among other measures. Given that fewer studies exist in relation to this study, more needed to be done in order to add more information in relation to determinants and adoption of GSCM practices. More also needed to be done with regard to firms in Eldoret, Kenya. This study, therefore, sought to establish the determinants of the adoption of GSCM practices in selected manufacturing firms in Eldoret town, Kenya.

NULL HYPOTHESES OF THE STUDY

This study was guided by the following null hypotheses:

H_{01} Government regulations and policies has no significant relationship with GSCM adoption

H_{02} Competitors influences has no significant relationship with GSCM adoption

III. LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

Government Rules & Legislation which is also a driver states that the rule of law is a system of government in which a society adopts or maintains a set of good, just, and fair laws by which its government will be governed. All government officials and all private citizens must follow the laws of the nation and the rule of law is the principle that governmental authority is legitimately exercised only in accordance with written, publicly disclosed laws that are adopted and enforced in accordance with established procedure. The government is created by and for the people and is answerable to the people. Government Rules & legislation is a major driver for company's environmental management. Regulations increase the threats of penalties and fines for non-compliance among companies. This driver is most helpful for implementing and adoption of GSCM in manufacturing industries (Bhool & Narwal, 2013).

The Ministry of Environment and Mineral Resources is the official policy organ of the Government of Kenya for the management and conservation of the environment and natural resources. In this regard, the Ministry is expected to formulate policies, standards and procedures to support the implementation of sustainable development. Further, the Ministry is the link to internal Multi-lateral Environmental Agreements (MEAs) to which Kenya is Party thus providing modalities for domestication and negotiations. NEMA is the

Principal agency of government for the implementation of all policies related to the environment. The Authority implements environmental legislation including the Environmental Management & Coordination Act (EMCA) and relevant regulations. The Kenya Meteorological Department **(**KMD) facilitates access and interpretation of meteorological data, information and related services. The Department of Resource Surveys & Remote Sensing (DRSRS) is mandated to undertake natural resources mapping using remote sensing techniques. In this regard, DRSRS undertakes collection, analysis, manipulation into resource maps and storage of natural resource database. The Mines and Geology Department is mandated to carry out geological survey, prospecting and research on mineral resources in the country (NEMA, 2012).

Nimawat and Namdev (2012) stated that GSCM is a very powerful way to differentiate a company from its competitors and it can greatly influence the plan success. With increased awareness to corporate responsibility and the requirement to meet the terms with environmental policy, GSCM is becoming increasingly important for Indian manufacturers.

Analysis carried out by Rao and Holt (2005) found that "greening" the different phases of the supply chain leads to a more integrated and co-operative supply chain that ultimately results in greater competitiveness. Adopting GSCM leads to saving manufacturing cost and increase the profit. Cost reduction refers to the conservation of energy, water, and raw materials. The valuable of cost reduction is environment improvement and reduction of cost (Agan, Acar, & Borodin, 2013).

The study adopted Institutional theory, which developed from the behavioral theory of the firm, focuses on the purposeful efforts of individuals to respond to environmental pressures in ways consistent with the institution's rituals and formality and based on values that are important to the institution (Stinchcombe, 1997). Within institutional theory, there are three forms of isomorphic drivers namely, coercive, normative, and mimetic. Coercive is conforming in response to unavoidable requirements, such as regulatory pressure, normative is conforming in response to cultural norms, and mimetic is conforming to meet (mimic) the behaviors of competitors (DiMaggio & Powell, 1983). From the foregoing literature, we argue that GSCM is becoming a necessity in most modern firms by their governments and the customers at large.

IV. METHODOLOGY

The study adopted explanatory research design and used stratified random sampling technique to select 226 respondents who were employees of selected firms. Primary data was collected using structured questionnaires on a Likert scale of 1 – 5 points. To ensure Validity and Reliability, piloting was done in Raiply woods Ltd, Kenya and was not part of the data collected for the study. The researcher chose internal validity because this study adopted Explanatory research, which seeks to establish causal relationship between variables and reliability was the Cronbach alpha value which was found to be above the threshold of 0.7. The study had a response rate of 80.5%. Data was analyzed using descriptive and regression model. Coding was done and data entered into Statistical Package for Social Sciences (SPSS) for windows version 20.0 for analysis where outputs were shown in charts and tables.

V. RESULTS AND DISCUSSIONS

This study was to find out whether government regulations and policies determine the GSCM adoption in selected manufacturing firms.

The findings show that majority of the respondents either Strongly Agreed or Agreed in all the indicators of the variable above. B1: 206(91%), B2: 183(81%), B3: 158(70%), B4: 212(94%) and B5: 111(84%). The findings show that majority of the respondents concur that Government regulations and policies determine GSCM adoption in selected firms. The responses of the employees were sorted and summarized in Table 1 below.

VARIABLE	SA 1	A 2	U 3	D 4	SD 5
B:Government Regulations and Policies	161(71%)	45(20%)	2(1%)	9(4%)	9(4%)
B1: The Government has initiated GSCM regulations for firms					
B2: The Government has established agencies/ authorities to enforce GSCM initiatives	115(51%)	68(30%)	20(9%)	14(6%)	9(4%)
B3: There is evidence of education/ awareness on GSCM	90(40%)	68(30%)	43(19%)	14(6%)	11(5%)
B4:The firm complies with government regulations on GSCM	144(64%)	68(30%)	5(2%)	2(1%)	7(3%)
B5: The firm has a department dealing with GSCM initiatives	111 (49%)	78(35%)	14 (6%)	7(3%)	16(7%)

Table 1: Government Regulations And Policies On Gscm Adoption

Table 2 below shows findings of the effect of competitors on adoption of GSCM in the selected manufacturing firms.

The findings show that majority of the respondents either Strongly Agreed or Agreed in all the indicators of the variable above. B1: 203(90%), B2: 161(71%), B3: 205(91%) and B4: 206(91%). The findings show that majority of the respondents concur that effects of competition by selected firms determine GSCM adoption. The responses of the sampled employees were summarized in Table 2 below.

VARIABLE	SA 1	A 2	U 3	D 4	SD 5
C: Competition					
C1: GSCM is used as a tool for competition in the industry	149(66%)	54(24%)	5(2%)	9(4%)	9(4%)
C2: The leaders in the industry use GSCM as a competitive advantage.	93(41%)	68(30%)	43(19%)	11(5%)	11 (5%)
C3:The firm	147(65%)	58(26%)	5(2%)	7(3%)	9(4%)

adopted GSCM because competitors have embraced it					
C4: GSCM adoption reduces cost and increases profitability	138(61%)	68(30%)	11(5%)	2(1%)	7(3%)

Table 2: Effect Of Competitors On Adoption Of GSCM

The study sought to identify the reliability of the data used in multiple regressions. The multiple regression analysis also shows that H_{01}: Government regulations and policies have no significant relationship with GSCM adoption - The result of the regression analysis was that government regulations was significant ($\beta = 0.311$) at $P < 0.05$. This implies that the study rejected the hypothesis. This meant that the hypothesis was false. There is a significant relationship between government regulations and GSCM adoption. H_{02}: Competitors' influences have no significant relationship with GSCM adoption - The result of the regression analysis was ($\beta = 0.457$) at $P < 0.05$. This implies that the study rejected the hypotheses. This meant that the hypothesis was false. Thus, there was a significant relationship between competitors and GSCM adoption.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.497	.360		4.044	.000
	Government Regulations	.347	.092	.311	1. 217	.000
2	Competitors	.457	.051	.457	.529	.001
3	Cultural Influence	.436	.047	.416	2.002	.005
4	Customers Perception	.400	.112	.355	1.044	.000
5	"Green" Employees Availability	.355	.129	.326	3.847	.001

a. Dependent Variable: GSCM Adoption

Table 3: Regression Coefficients

VI. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

We can state based on the findings of this study that government regulations/policies and competition by firms are determinants of adoption of GSCM in selected manufacturing firms in Eldoret town, Kenya. The results based on hypothesis H_{01} shows that most of the respondents strongly agreed and agreed that Government has initiated GSCM regulations for firms. The result of the regression analysis was ($\beta = 0.311$) at $P < 0.05$, hence, there was a significant relationship between government regulations and GSCM adoption. The results based on hypothesis H_{02} shows that most of the respondents strongly agreed and agreed that GSCM is used as a tool for competition in the industry. The result of the regression analysis was ($\beta = 0.457$) at $P < 0.05$. Thus, there was a significant relationship between competitors and GSCM adoption.

Based on the findings, this study concludes that government has set up regulation and policies governing GSCM adoption. It also concludes that the Government has initiated GSCM regulations for firms and has established agencies/ authorities to enforce GSCM and that most of the selected firms comply with government regulations on GSCM. This study also found evidence that GSCM is used as a tool for competition in the industry. It reduces costs and increases profitability of a firm and often used as competitive advantage of the selected manufacturing firms in Eldoret town. Customers often ask for products that are friendly to the environment, hence, exposing firms that have adopted GSCM and those that are yet to adopt.

The study recommends that since regulation is one of the most important factors in adoption of GSCM, the government should strengthen existing ones and form new specific ones if need be in the manufacturing industry. This should be done through benchmarking with developed nations that have adopted green initiatives in the manufacturing industries.

On Competition, there should be free markets in the country to encourage firms to compete through use of GSCM. Through strengthening of the above recommendation (government regulations and policies), manufacturing firms are forced to adopt GSCM creating a platform where customers demand environmentally friendly products. The government must also educate and sensitize her citizens about GSCM.

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