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Effects of Customer Feedback on the Sustainability of Green Supply Chain System in the Floriculture Industry in Kenya

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Abstract
This is an empirical research with the overall objective of studying the sustainability of green supply chain systems in the floriculture industry in Kenya. The floriculture industry is a crucial sector in the country since it is a key export contributing a significant percentage of the Gross Domestic Product (GDP) and creates employment for tens of thousands of workers. There have, however, been pressing concerns in the country about the non-sustainability of green supply chain systems in the industry. This study focused on customer feedback as one of the study variables and employed survey design where a total of 127 flower farms were sampled; 14 during the pilot study and 113 during the main research. The data collection was done with the aid of questionnaires, observation guides and interviews. The resultant data was analyzed to test the hypotheses. The study, ultimately, came up with recommendations based on the research findings to solve the research problem.
Key words: Customer Feedback, Green Supply Chain System, Floriculture, Sustainability.

1. Introduction

Horticultural supply chains have transformed Kenya and cut flowers are an important export for the country (Marwa & Zairi, 2008, Nyangena & te Velde, 2012). The cut-flower industry, mainly owned by private entrepreneurs, generates approximately 11% of Kenya's total foreign exchange revenue (Nyangena *et al*, 2012). Due to the growth of the industry, environmental concerns are growing particularly with regard to the use of pesticides and chemical fertilizers, disposal of waste materials, and the protection of water bodies (Getu, 2009). Becht (2007) states that the large flower farms in Kenya pollute the water, environment and destroy the surrounding biodiversity. Environmental issues such as water quality, greenhouse emissions, chemicals and exotic pests have been implicated as factors that pose a great challenge to the future of the industry (Kargbo, Mao & Wang, 2010).

Globalization, cultural exchanges, and celebrations enhancing fraternity such as New Year, Valentine's Day, Christmas and weddings have induced people globally to use flowers as a means of sharing their feelings (Belwal & Chala, 2008). Increased use of flowers and ornamental plants makes the marketing of flowers a lucrative business (Belwal *et al*, 2008). Kafa, Hani and Mhamedi measure green supply chains based on Green Purchasing, Eco-Design, Green Production, Green Distribution and Reverse Logistics (Kafa, Hani & Mhamedi, 2013). Any firm with a score below 4/5 (0.8) is considered as falling below the sustainable green supply chain system standards (Kafa *et al*, 2013). Failure to meet the sustinability standards in the suppply chain systems can lead to diminishing demand and gradual erosion of earnings from the sector (Government of Kenya (GOK), 2013).

2. Statement of the Problem

The floriculture industry plays a pivotal role in Kenya's economy since it is a leading foreign exchange earner and employs thousands of people (Sipalla, 2012, GOK, 2013). There was a seven percent (7%) decline in exports in the sector over the period 2011-2013 partly due to inability to sustainably meet the green supply chain standards instituted by the European Union (EU), the largest market for the export (Ndege, 2014). The industry's supply chains are characterized by non-green practices culminating in customer and government complaints (Chrintz, 2001, Dey *et al*, 2011, KFC, 2013). Non-green supply chains affect the ecology, the flower farm workers, surrounding communities and the ultimate customers (Sipalla, 2012, Gudeta, 2012, Getu, 2009) and have the potential of damaging the brand value leading to shrinkage in flower demand with consequent decline in revenue (Dey *et al*, 2011). They frustrate the achievement of the United Nations Millennium Development Goals (MDGs) on environmental sustainability (Maathai, 2011).

3. Research Objectives and Hypothesis

This study had the overall objective of establishing the determinants of the sustainability of green supply chain system in the floriculture industry in Kenya. One of the specific objectives was to determine whether customer feedback affects the sustainability of green supply chain system in the floriculture industry in Kenya. The study on the customer feedback variable was guided by the null hypothesis:

H_0: Customer feedback does not affect the sustainability of green supply chain systems in the floriculture industry.

4. Theoretical Review

All supply chains exist to serve the ultimate customer (Porter, 2009). In this case, therefore, customer demands and perceptions are felt throughout any learning supply chains (Porter, 2009). The Ethical Consumerism Theory postulates that consumers consider ethical factors when buying goods and services that are produced and offered ethically by companies that act ethically (Tustin & de Jongh, 2008). Acting as an 'ethical consumer' can take on a number of often subtle forms according to Tustin *et al* (2008): Positive buying, Negative purchasing, Company-based purchasing and the fully screened approach. For the consumer, the concept of ethical consumerism refers to the existence of consumer preferences for products and services that conform to their ethical aspirations (Tustin *et al*, 2008).

Consumers may be inclined to purchase products and services that reflect ethical preferences, or they may select products and services from companies that have an ethical reputation (Field & Field, 2006). Ethical consumerism may also involve the active boycotting of companies that are perceived to have acted unethically. Ethical consumerism is a key consideration for future brand strategy development in the floriculture industry (Field *et al*, 2006). There is a direct correlation between consumer awareness and the ethical consumerism phenomenon (Tustin *et al*, 2008). The floriculture industry exports its produce mainly to European markets (GOK, 2013). The European customers are some of the most enlightened and, hence, highly likely to influence floriculture firms with regard to the greenness of their supply chains (Chrintz, 2001). This theory triggered the choice of the following research hypothesis: ***H_0:*** *Customer feedback does not affect the sustainability of green supply chain systems in the floriculture industry.*

5. Operationalization of Sub-Variables

5.1 Eco-Literacy

Over the years, a majority of consumers have realized that their purchasing behavior had a direct impact on many ecological problems (Laroche, Bergeron & Barbaro-Forleo, 2001). This led customers to considering environmental issues when shopping (e.g. checking if the product is wrapped in recycled material) and by purchasing only ecologically compatible products (Laroche *et al*, 2001). This behaviour was mainly characteristic with consumers in the medium and high incomes brackets who were more likelyto act in an ecologically compatible manner due to their higher levels of education and therefore to their increased sensitivity to social problems (Laroche *et al*, 2001). Sustainable consumption requires a level of environmental knowledge, for example, gained through information pamphlets and education schemes (Sonigo & Bain, 2012). According to Diamantopoulos, Schlegelmilch, Sinkovics and Bohlen (2003), there is ample empirical evidence that environmental concern is a major factor in consumer decision making.

5.2 Eco-Politics

According to Doonan, Lanoie and Laplante (2005), customers are a major financial stakeholder and can exert considerable pressures and demand goals of sustainability or environmental performance from suppliers. Green consumers engage on environmental issues at an everyday level (Connolly *et al*, 2010). According to Fouka and Mantzorou (2011), consumers can solve the problems of 'global injustices'through the medium of consumption. These global injustices include the provision of services that do not meet the expected environmental standards. Horton (2003) states that consumer politics is very advanced in the area of food shopping - green processes were most advanced. Eco-politics can be a strong stimulus to the adoption of sustainable green supply chains (Dolan, 2002). Customer activism has forced corporates, and flower farms, to listen to the customer and take in to consideration their expectations with regard to environmental compliance in their products (*Toke, Gupta and Dandekar, 2010).*

5.3 Consumer Protection Laws

Consumer protection is a group of laws designed to ensure that the rights of consumers as well as fair trade competition and the free flow of truthful information in the marketplace (Gifis, 2006). Consumer protection laws are a form of government regulation, which aim to protect the rights of consumers (Mairi, 2010). Increasingly, the contemporary understanding of green consumption has become tied to the discourse of

sustainability, that is, the concepts of sustainable consumption and sustainable development (Connolly *et al*, 2010). The result is that the practices consumers engage in are now discussed in terms of the environmental sustainability of such practices (Connolly *et al*, 2010). As such, green consumption is now associated with attempts to lower the level of material and energy consumption used by following the agenda of sustainability, environmental organizations have been forced to address the ambiguity surrounding the core concepts of sustainability (Connolly *et al*, 2010). According Welfens (1999), eco-labelling element should become an important demand for all consumer goods.

5.4 Customer Socio-demographics

A socio-demographic is a word used to describe an element of a group within a society (Mairi, 2010). According to Diamantopoulos *et al* (2003) many consumer products and services companies focus primarily or even completely on demographics'' because socio-demographic variables, compared to other segmentation measures, are more readily available and can be applied to segmentation problems with relative ease. Socio-demographics are an inexpensive tool in profiling customers as to whether they are green or grey (Diamantopoulos *et al*, 2003). The reasoning behind this is that factors such as age, education, gender and religion will determine whether a customer with view products or services from the ecological perspective. Socio-demographics are the primary drivers for green consumer behaviour (Diamantopoulos *et al*, 2003). Green-conscous consumers can feel guilty of using commodities such as cars (Connolly *et al*, 2010). Consumers' demographic characteristics on their environmentally conscious behaviour exert a significant influence (Laroche *et al*, 2001).

6. Empirical Review

The research conducted by Albayrak , Aksoy and Caber (2012) aimed at comparing the environmental concerns and scepticism levels of the participants and whether or not they display green purchase behaviour and to investigate the influence of environmental concern and scepticism on green purchase behaviour by utilizing the Theory of Planned Behaviour. The study adopted a case-study approach and the data was collected from participant and non-participant customers of the e-invoicing program of Turk Telecom. The research results showed that those customers who had a high level of environmental concern and less sceptical reflect a positive attitude, have a high positive subjective norm and perceived behavioural control that motivates them to have stronger intentions to become e-invoice subscribers in the near future. The study results indicated that the age, gender, income and education socio-demographic variables affect green purchasing behavior among customers.

Gupta and Ogden (2009) conducted a research that drew on social dilemma theory and reference group theory to explain the attitude-behavior inconsistency in environmental consumerism. The research sought to understand why, despite concern towards the environment (attitude), consumers fail to purchase environmentally friendly or green products (behavior). A survey instrument was developed that used scales to measure eight independent and one dependent variable. The results from the study revealed that several characteristics of the individual – trust, in-group identity, expectation of others' cooperation and perceived efficacy – were significant in differentiating between "non-green" and "green" buyers.

7. Research Methodology

This study adopted a descriptive research design. A descriptive study describes the state of affairs as it exists and results in the formulation of important principles of knowledge and solution of significant problems (Kombo & Tromp, 2006). The target population of the study constituted the 137 flower farms which form the total membership of Kenya Flower Council (KFC, 2013) (major flower farms in Kenya). The research adopted the survey design approach in the data collection process and used semi-structured questionnaires and interview guides to gather the data for analysis. Interviews were also conducted to obtain expert views from the concerned lead organizations: the KFC, National Environmental Management Authority (NEMA), Horticultural Crops Development Authority (HCDA) and a floriculture consultancy. Secondary data was collected through the theoretical and empirical review. A pilot study was conducted using 14 flower farms to establish the reliability of the research instrument. Cronbach alpha was used and it gave a result of 0.802 for the Local Environmental Regulations variable which implies that the research instrument could provide consistent results (Huber, 1981). This research used descriptive, requisite and inferential statistics to analyze the data. These computations were performed using the Statistical Program for Social Science (SPSS).

8. Results and Discussion

The pilot study of this research involved 14 flower farms whereas the main study involved 113 flower farms across the country with the initial survey target being 139. Hence, 88% of the target flower farms were reachable

(sampled) during the pilot survey and the main study. The study sought to find out the significance of the Customer Feedback and established a Cronbach Alpha of 0.789 meaning that the variable was significant in determining the sustainability of green supply chain systems. The study used tolerance and Variance Inflation Factor (VIF) values for the predictors as a check for multicollinearity. The tolerance values were between 0.650 and 0.924 with corresponding VIF values between 1.083 and 1.539 implying that there was no multicollinearity in the model.

A Confirmatory Factor Analysis (CFA) was ran using a loading factor of 0.800 as recommended by Zikmund (2008) for a study of this nature. The CFA tool helps in the identification of variables that would best explain the variance observed in each variable (Cooper *et al*, 2008). There was a result of .990 for the Customer Feedback implying that the variable explained a high percentage of the total variance and, hence, relevant for making the research inferences. The hypothesis was tested by regressing customer feedback on the sustainability of green supply chain systems.

The hypothesis was tested by regressing customer feedback on the sustainability of green supply chain systems guided by the equation $Y= \beta_0+\beta_1X$ where X represented customer feedback and Y denoted the sustainability of green supply chain systems. The results of the regression are presented in table 1. The results show that the influence of customer feedback was significant ($F = 165.086$, $p < 0.05$). The coefficient of determination (R Squared) is 0.859 implying that it explains the variability of the independent variable by up to 85.9% (R Squared = 0.859, $p < 0.05$). The results are also demonstrative of the fact that the sub-variables, ecoliteracy, ecopolitics, consumer protection legislation and consumer socio-demographics explain the variability in the sustainability of green supply chain system.

Given the level of significance of the Anova (0.001), the regression results presented demonstrate that customer feedback affects the sustainability of green supply chain system in the floriculture industry. The hypothesis that customer feedback does not affect the sustainability of green supply chain systems in the floriculture industry was therefore rejected. As customer feedback increases, the sustainability of green supply chain systems increases too. The research findings correspond with Prothero (2010) who stated that there are few sophisticated customers who can significantly influence the state of 'greenness' in the floriclture supply chain systems. They, however, disagree with Halkier (1999) who indicated that floriculture clients have sufficient information to exert considerable pressures and demand goals of sustainability or environmental performance from suppliers. The findings contradict the Ethical Consumerism Theory that states that there are consumers who engage in purchasing only if the goods and services are produced and offered ethically by companies that act ethically (Tustin *et al*, 2008).

Table 1: Regression Results for the Customer Feedback and Sustainablity of Green Supply Chain System

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.927[a]	.859	.854	.17657

Anova

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	20.588	4	5.147	165.086	.001[b]
Residual	3.367	108	.031		
Total	23.955	112			

a. Dependent Variable: Green Supply Chain System

b. Predictors: (Constant), Ecoliteracy, Customers Demand Sustainability in Produce, Customers Have Knowledge on Ecological Issues, Import Countries have Laws on Eco-Labelling Flowers.

Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	.564	.202		2.794	.006
Ecoliteracy	.265	.043	.792	6.195	.000
Ecopolitics	.250	.066	.594	3.796	.000

Consumer Protection Legislation	.286	.068	.719	4.202	.000
Consumer Socio-demographics	.001	.030	.003	.044	.005

a. Dependent Variable: Green Supply Chain System

Normality Test

The normality test was conducted using the Shapiro-wilk test. This test provides the indication as to whether the data came from a normally distributed population (Shapiro *et al*, 1965). The test results indicated that the standardized residuals are significantly normally distributed with a significance of 0.002 which is less than 0.05. The test results illustrated in table 4.29 show that the independent variable Customer Feedback determine the Sustainablity of Green Supply Chain System.

Table 2: Normality Test of the Standardized Residuals for Customer Feedback

	Shapiro-Wilk		
Standardized Residual	**Statistic**	**Df**	**Significance**
Customer Feedback	0.932	116	0.002

9. Summary of Findings and Recommendations

The research found out that customer feedback influences the sustainability of green supply chain systems in the floriculture industry in Kenya. The customer feedback explains the variability in the sustainability of green supply chain system by up to 85.4%. The research found out that there were varying degrees of influence by the customer feedback sub-variables on the sustainability of the green supply chain system. The Ecoliteracy, Consumer Protection Legislation and Consumer Socio-demographics have a positive influence on the sustainability of green supply chain systems whereas eco-politics has a non-positive influence.

The floriculture industry clients are educated on green supply chain issues and are quite activist given that they demand for greener standards in the produce. The floriculture import countries have some form of legislation that constrains the exporters to comply with certain green standards. The consumer socio-demographics such as age, religion and gender don't play a key role in the flower demand matrix and concerns on green standards. The findings partly contradict the Ethical Consumerism Theory that states that there are consumers who engage in purchasing only if the goods and services are produced and offered ethically by companies that act ethically (Tustin *et al*, 2008).

The flower farm strategists should establish regular formal and informal sessions with their clients with a view to gaining current insights in to the green supply chain standards expected of the products. The insights gained from such sessions should be translated in to process improvements to elevate the standards of the green supply chain system in to levels that seamlessly dovetail in to client expectations. It is through such sessions that the flower farms can amputate (minimize) the green politics (Ecopolitics) that may have adverse effects on the demand for the produce in the industry. Future researchers should consider carrying out a similar study in a different sectors to establish the variation in responses.

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