CONTRIBUTION OF INTERNAL STAKEHOLDERS ON ADOPTION OF GREEN SUPPLY CHAIN STRATEGY BY MANUFACTURING FIRMS IN KENYA

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ABSTRACT

Green issues are top on the global agenda with governments and corporate setting out to identify ways of addressing the challenge. This paper examines the contribution of internal stakeholders in adoption of green supply chain strategy by manufacturing firms in Kenya. The target population was manufacturing firms registered with Kenya Association of Manufacturers as at 2013. A sample size of eighty drawn from five sectors through multistage approach was used in this study. The data was analyzed using logistic regression approach were five variables were analyzed to assess their contribution towards adoption of green supply chain strategy by manufacturing firms in Kenya. The empirical evidence revealed that internal stakeholders influenced firms desire to adopt the strategy most. The contribution of internal stakeholders to adopt emanates from the owners and top management with minimal pressure coming from the employees.

Key words: Internal stakeholder, drivers, green supply chain strategy

1.0 INTRODUCTION

Traditionally business and society saw nature as a provider of free goods such as water, air, minerals and waste disposal facilities. The era of the Industrial Revolution spanning early 19th century to 1950, resulted in shortages that were marked with inventiveness and innovation resulting in mechanization of manufacturing processes, which led to some negative impacts on the environment. From the economic point of view, growth in industrialization leads to increase in economic growth and this triggers population growth and consequently consumption increases without expansion of the natural resources or space.
The green revolution has and it is likely to affect every business activity in future and increasing attention towards environmental matters calls the firm to react and adapt its strategy to the new issue (Tutore, 2010). The environmental pressures (drivers) that affect a business may come from sources inside and outside the firm. External sources include industry requirements (customers and suppliers), financial institutions, regulatory authorities and public bodies (local, regional, national and global). Internal pressure include desire of marketing departments to ‘green’, the legal mandates of health and safety inspectors, fiduciary stewardship concerns of board members and employees desire for green environment. Overall strategy should be designed to address all this (Cousins, Lamming, Lawson, & Squire, 2008). Supply Chain Management deals with total business process excellence and adding “green” component involves addressing the influence and relationships of SCM to the natural environment (Sarkis, 2005). Supply chain input resources such as fuel, energy, natural resources and consequently, pressure from the stakeholders, deserve close attention in order to determine the influence of some drivers and trends that have an impact on an organization’s supply chain (Centikaya, 2011). Literature citing green issues varies from highly developed countries to least developed. Most researchers cited are those from Europe and United States and China is following closely with Africa occupying the lowest position (Large, Chiou & Cetinkaya, 2011).

Statement of the Problem
Green issues are top of global agenda with the result of a myriad strategic approaches being adopted by firms to overcome the challenge and to gain competitive advantage. The interaction of a firm with the environment can be viewed in four ways, which include; the firm and its survival, the immediate business environment, the society in which it operates and the natural environment which is the source of its livelihood. Internal factors relate to a company’s strategic attitude, which heavily depend on managers’ environmental awareness (Oral, 2009). Kenya vision 2030 in assessing the impact of external environment envision that the growing world economy and population offers an expanded potential market for Kenyan products, but literates that other global economic trends such as outsourcing, environmental concerns and increased demand for raw materials are likely to impose greater competition for countries like Kenya (Republic of Kenya, 2008). In addition to resource use, linkage with global suppliers exposes manufacturing firms to environmental problems of other nations, which include creating space for dumping, acquiring obsolete technology, logistical problems and legal issues. As ecological and social responsibility become increasingly important to the society, managers' values and perceptions on environmental issues would be shaped by the dominant norms of the society towards environmental protection, which in turn would generate positive managerial initiatives by a firm's environmental management (Wenwei & Kang, 2011).

Empirical evidence shows that in Kenya, firms, the government and environmental campaigners have undertaken various green initiatives but there are no studies typical of a green supply chain model. In spite of the high potential of a green supply chain strategy to help overcome green issues and voicing of improved industrialization for economic growth, the adoption of a green supply chain strategy as a means of addressing green issues impacting the manufacturing sector
in Kenya does not seem to have any study. A key question arises as to what contributes to adoption of GSC strategy in light of green issues facing firms in Kenya.

**Research Objective**
The general objective was to assess the contribution of internal stakeholders on adoption of green supply chain strategy by manufacturing firms in Kenya.

**Research Question**
Do Internal Stakeholders contribute to adoption of green supply chain strategy by manufacturing firms in Kenya?

**Hypothesis**
The researcher postulated the following null hypothesis which was tested.
Hypothesis (H0): Internal stakeholders do not contribute to adoption of green supply chain strategy by manufacturing firms in Kenya.

**2.0 LITERATURE REVIEW**

**Introduction**
The literature reviews the problem of drivers of adoption of green supply chain strategy by manufacturing firms. The chapter begins with theoretical evidence of adoption of green supply chain strategy, driven by demand for firms to become environmental friendly (green). Empirical evidence drawn from developed and developing countries forms part of this literature review.

**Theoretical Framework**

Literature shows that the problem of scarcity, increased industrialization, increasing awareness of the consumers about environmental issues, business, households and governments want for green products push firms to adopt strategies that integrate environment (green issues) with business aspects (supply chain) in order to overcome the challenge (EITayeb, Zailani, & Jayaraman, 2010). Theory states that SCM is the conduit through which value is created and delivered, thus a green strategy embedded in a firm’s operations and supply chain management ultimately minimizes a firm’s total environmental impact from start to finish of the chain and from beginning to the end of the product life cycle. SCM deals with total business process excellence and adding “green” component involves addressing the influence and relationships of SCM to the natural environment (Zhu, Sarkis, & Geng, 2005).

**Systems Theory**
System theory stresses the effects of external systems on the decisions and behavior of an organization; where external systems include regulations, the law, professional standards,
interest organizations and social belief. System theory characterizes the effects of external pressure on organizational structure (Chien, 2007). The public is increasingly becoming environmental conscious and in addition to the statutory requirement due to government policies and regulations, and pressure from organized groups many companies are expected to be swayed towards adopting a green manufacturing or environmental management system policy.

**Stakeholder Theory**
Stakeholder is a theory of organizational management and business ethics that addresses morals and values in managing an organization. The basic proposition of stakeholder theory is that a firm’s success is dependent upon the successful management of all the relationships that a firm has with its stakeholders (Umalomwa & Jafaru, 2012). The internal stakeholders who include employees, managers and owners react differently from the external stakeholders to the same stimuli. Supplier-manufacturer relationships are considered important in developing a sustainable competitive advantage for the manufacturer (Sheth and Sharma, 1997).

**Conceptual Framework**
Ecological and ‘green’ issues is a strategic theme in purchasing and supply and aspects considered for a typical manufacturing firm include; products designed and purchased, packaging materials, production processes, natural resources exploited and problems associated with creating and disposal of waste. Adoption of green supply chain strategy is sum total of at least four supply practices which include green purchasing, green production, green marketing and reverse logistic (Sarkis, 2005). Institutional theory, systems theory and shareholder theory explain the drivers of adoption of green supply chain strategies, hence the independent variables. This conceptual framework serves to explain how manufacturing firms respond strategically to green issues affecting their operations across the entire supply chain. Pressures and drivers for adoption and improving environmental performance arising from regulators, supply chain partners, competitors and the market contribute to adoption of green strategy (Zhu, 2005). Figure 2.1 give a schematic representation of the relationship between the driver and adoption of strategy.

![Conceptual Framework](image)

**Figure 2.1: Conceptual Framework**

**Internal stakeholder Driver:**
- employees
- managers
- Owners

**Adoption of green supply chain strategy:**
- green purchasing practices
- green design
- green marketing practices
- Reverse logistics

**Independent Variable**

**Dependent Variable**
Supply Chain Management like other disciplines relies heavily on concepts, definitions, theories, rules and principles of other disciplines. Understanding a firm’s strategic Supply Chain Management focus sets a level ground for evaluating its responsiveness towards the adoption of green supply chain strategies to mitigate negative environmental impacts and business downturn (Sachan and Datta, 2005). In terms of ontological thinking, the interaction of a firm with the environment can be viewed in four ways, which include; the firm and its survival, the immediate business environment, the society in which it operates and the natural environment which is the source of its livelihood (Oral, 2009). Internal factors relate to a company’s strategic attitude, which heavily depend on managers’ environmental awareness. External variables on the other hand identify drivers of environmental pressures as those relating to cost control, total quality management, communities, investors and environmental regulations. However, such environmental drivers do not affect a company’s pattern of environmental behavior in equal measure and their influence depends on industry-and country-specific factors (Azzone and Coci, 1998).

**Internal Stakeholders**

Internal stakeholders who are the managers, employees and owners make a firm a better means of managing production than the market. Work is internally linked to the people who perform it, whereas capital is only externally linked to the people who possess it. Firms have multiple purposes many of which are non economic such as; to act with respect towards the environment, to produce goods and services that contribute to improvement of society, to provide employees with an environment in which they can develop both as persons and as professionals and to obey the just laws of a countries in which the operate (Lutz and Mimbi, 2004). Top management when viewed from an internal perspective drives the adoption of green purchasing strategy (Zailani, 2010). The internal functions including healthy, safety and environment (HSE), operations, engineering, marketing, accounting, human resources and information systems interact to influence strategic choice in relation to green issues (Sarkis (2006). Research and strategic management authors strongly support the notion that the success of strategy formulation and implementation depend on top management support. Top management is the key driver of firm to take part in green supply chain strategies (Zailani and Wooi, 2010). According to institutional theory, institutional pressures affect a firm if powerful agents within the firm recognize the pressure and perceive that compliance is important and will increase legitimacy (Dimaggio, 1983).

The company’s environmental culture represents one of the most important determinants in the definition of the environmental strategies, which depends on the company’s history, the fields where it operates and the country in which it has the headquarters or its plants. Thus, each firm, according to its own strategic orientation decides whether to include environmental factors into the overall process of strategy formation (Azzone et al., 1997). A manufacturer is the one who designs and develops the product or packaging, as well as choosing the materials for that product.
or package. It is at this point that the most efficient and effective decision can be made to reduce waste and encourage reuse. Reduction and recycling is at the product design and development stage, a point in the product's life cycle when crucial decisions can be made to minimize the environmental impact of their product (DANIDA, 2005).

Small firms face various difficulties and barriers to adopt green supply chain initiatives, secondly, the poor environmental performance of small suppliers can affect the performance and image of buying companies. The problem is aggravated by the fact that stakeholders often do not distinguish between an organization’s environmental practices and the practices of its suppliers (Zailani, et al., 2010). The responsibility to ensure that the industry is strategically fit to reduce environmental impact does not rest with the consumer or the government but the firm itself. Employees who work under harsh environmental conditions affect productivity. Those that are aware of their green rights will demand for the same and if this is absent then consequences of employee turnover will increase. In Kenya, it is a mandatory requirement for manufacturing firms to insure their employees against such risk as stipulated in Occupational Safety and Health Act (OSHA), 2008. From the foregoing, it is quite evident that the issue of green supply chains is a promising area of study and practice that has great potential to provide significant benefits for the firm and the society.

**Research Gaps**

The impacts of the environment are transmitted through the supply chain and a gap exists as the concept is not fully understood by most in developing countries as reviewed by literature available. Even in developing countries where the concept began, few success stories have been documented and environmental problems are top on the agenda. A survey carried by PWC that considered 200 workers and 200 representative groups and companies in China, Honduras, India, Kenya, the US and Europe noted that codes of conduct were insufficient to achieve sustained improvements on their own, requiring the implementation of capacity building and worker empowerment programs and that suppliers have an insufficient understanding of the business benefits associated with making required investments in CSR (Robinson and Strandberg, 2008). In assessing the drivers of adoption of green supply chain strategies particularly CSR and perceived benefits, most studies have not factored this shortcoming though it could have an implication on the results of the study. The study involved both developed and developing countries, which leaves a gap for research of specific drivers per country, a reason that justifies the choice of study for Kenya targeting manufacturing firms.

There is great concern for manufacturing firms globally as well as locally, to deal with increased global warming and carbon emissions and embrace sustainable or eco-friendly practices. This affects the entire firm, but more so it impacts the firm’s supply chain. Empirical evidence through study that sort to establish the relationship between the green supply chain strategy employed by the large manufacturing firms in Nairobi and their sustainable competitive advantage, found out that, large manufacturing firms in Nairobi had gained and sustained greater
competitive advantage, in terms of goodwill, market share, returns on investments and even profitability, as a result of implementing green supply chain strategies (Katua, 2012). This study targets only registered manufacturing firms with Kenya Association of manufacturers agency as at 2013, thus excluding the tertiary sectors and other non-registered manufacturing firms who play a key role in supply chain management. If a link can be established between green issues related drivers and adoption of green supply chain strategy, then it might be possible to recommend green supply chain strategy in promoting a higher response to green issues facing manufacturing firms.

3.0 METHODOLOGY

The chapter expounds on the research design, target population, sampling frame, sampling techniques, methods of data collection, procedure for data analysis and presentation. To explain some causal relationships anticipated in respect of drivers of the adoption of green supply chain strategy by manufacturing firms, survey research design was be explored. Surveys help quantify social phenomenon particularly of issues, conditions and problems that are prevalent in society (Mugenda, 2008). The method of choice for portraying all the variety of a large heterogeneous population is that of sample survey (Shaughnessy, Zechmeister, & Zeichmeister, 2003). The manufacturing firms in Kenya are heterogeneous even within the 12 sectors. The large manufacturers in Kenya are subject to environmental regulation which in Kenya is the Environmental Management Coordination Act (1999), trade Acts and pressure from the market and other stakeholders. Internal stakeholders were assessed in relation to adoption of green supply chain strategy. The study combines issues related to the environment (green issues) and business aspects (supply chain), and therefore the target respondents were those with some knowledge about the two aspects who included officers in procurement and supply chain department, strategic management/environmental managers, marketing department and production and operations department.

The study adopted a mixed research design where qualitative approach was used for the benefit of measuring the perception and expert capability of business managers to identify green issues that are a prerequisite to development and implementation of green supply chain strategy. Qualitative data are a source of well grounded, rich descriptions of processes in identifiable local contexts and can preserve chronological flow, review which events led to which consequences and derive fruitful explanations, hence helping researchers to get beyond their initial perceptions (Miles and Huberman, 1994). The attitude of employees and owners priority towards adoption of green supply chain strategy was assessed using qualitative measures. The quantitative approach made use of numerical measurements such as the costs related to compliance to regulations, profitability and number of years since adoption of GSCS by firms. The study's aim was to assess the attitude of the firms in relation to the green issues affecting the globe and by extension their businesses.

Target Population
There were 698 members registered in Kenya Association of Manufacturers directory as at December 2013 who represent all the 13 categories, with one in the service sector hence outside the subject of our study. All members face challenges (green issues) bordering on compliance with law on environment, standards, market expansion and quality and cost of energy and water, in addition to legislation of dumping and entry of counterfeits (KAM, 2012).

**Sampling Frame**
To ensure adequate coverage of the population of the large manufacturers in Kenya and ease of access, the sample frame consisted of KAM registered members within Nairobi and its surrounding areas as per the 2013 KAM directory. Nairobi has heavy concentration (80%) of these manufacturers’ in its industrial areas rendering it an ideal target location with a population of 441 firms. This led to a sample frame of 441 firms already defined into subsets. The firms cut across the 12 manufacturing sectors, each sector exhibit different characteristics and they benefit from KAM’s prerogative to create environmental awareness and receive assistance to comply with the law and environmental stewardship.

**Sample size and Sampling Technique**
A large sample size has the benefit of reducing the degree of multicollinearity especially where the sample population is heterogeneous as is the case with this study target population (Kennedy, 2008). Multistage sampling technique was used to select a sample size of 80. The first stage entailed random selection of five sub-categories (clusters) from among the 12 sectors since strategy adoption is a matter of strategic choice. In this stage random number 18 obtained from the table of random numbers led to the selection of five strata with random numbers 01, 03, 04, 09 and 10 which were namely; Building and construction, Energy, electrical and electronics, Food and beverage, Pharmaceutical and medical and Plastics and rubber.

**Research Instruments**
Questionnaires allow data to be standardized thus enabling easy comparison (Saunders, Lewis and Thornbill, 2009). This instrument was used as the main one for this study because it allowed for pretesting, reliability and consistency in addition to cost and time factor. The questionnaires contained two major sections, the items affecting the adoption of GSCS (drivers) and practices corresponding to adoption of GSCS strategy.

**Data Collection Procedure**
The questionnaires constitute the tool of data collection targeting managers in procurement/supply chain, environmental management, production or marketing/strategic management. The instrument was designed in such a manner to permeate appropriate measurements of the dependent and independent variables. The dependent variable in this study is adoption of green supply chain strategy. The measures for this variable include green purchasing strategies in acquisition of materials, green manufacturing or DFE, green marketing strategies and reverse logistics, hence the green supply chain strategy concept. The independent variable, which constitute pressure or motivators (drivers) for firms to adopt the green strategies across the supply chain assessed was internal stakeholders. The survey items were grouped under the variable where questions were answered using a five-point Likert-type scale, open, and

Pilot Study
10 firms drawn from KAM list of manufacturers through convenience sampling, and the questionnaires were distributed through drop and pick method. The results of the pilot study were analyzed for reliability by testing for internal consistency using Cronbach’s Alpha test which yield a result of 0.89. Alpha coefficient of 0.7 or above is an acceptable reliability coefficient to advance the use of the instrument after the pilot study.

Data Processing and Analysis
A review of SCM and logistics research revealed that, behavioral and economic approaches influence the researches hence the prevalence of positivist method. There is limitation of quantitative methods because of interdependence among supply chain hence the need for triangulation (Sachan et al, 2005). Based on the conceptual framework the independent variable was analyzed so as to determine the effects of the variable on adoption of green supply chain strategy by manufacturing firms and to assess the effects of alternative future scenario.

First, in order to provide a description of the sample from which data was collected, descriptive information of the category of the firm, size, supply chain function, and green practices were described, as well as the means and median of drivers and adoption of the strategy. Factor analysis was performed on grouped scale items of the variables to ascertain their relative importance in the study. Logistic regression and correlation analysis are popularly used to infer influences of strategic decision making in SCM, where correlation analysis serves to overcome the problem of multicollinearity, it however ignores the co-existence of other attributes (Sachan et al, 2005). The event (adoption of GSCS) in this study is stochastic hence a dichotomous dependent variable (Y). The questions structured in five-point Likert-type scale were in form of ordinal data which were transformed to interval measures. Logistic regression analysis examines influence of various factors on a dichotomous outcome by estimating the probability of the events occurrence. Logistic regression was used to examine the relationship of the variable (driver) and the log odds of adoption of GSCS which was a dichotomous outcome obtained by calculating the changes in the log odds of the dependent variable as opposed to the dependent variable itself. The likelihood function was used for estimating the probability of the data collected on the assumption that the probability of the observed values of the dependent variable would be predicted from the observed values of the independent variable. The model took the form presented below:

\[ \ln(Y) = \alpha_0 + \alpha_1 X_1 + \varepsilon. \]

Where, \( Y \) = the odds ratio - adoption of green supply chain strategy.

\( I \) denotes = those adopting the strategy, and \( 0 \) denotes otherwise

\( \ln(Y) \) denotes = natural logarithm of the ratio of the odds ratio

\( X_1 \) denotes = Internal stakeholders

\( \alpha_1 \) denotes = the coefficient, \( \alpha \) constant and \( \varepsilon \), the error term.
e denotes the error term assumed to be independent to follow some distribution.

The model was used in explaining the outcome in terms of percentage of adoption against those adopting and not adopting the green supply chain strategy.
4.0 RESEARCH FINDINGS AND DISCUSSION

The survey questionnaire was structured into four major sections namely; demographics which collected data on sector and firm size, the predicted driver, the green supply chain practices. The instrument was formulated with a combination of a five point Likert scale and other nominal and ordinal scales in addition to open ended questions. The dependent variable instrument was designed to collect categorical data which was collapsed to two categories, that is, those scoring 5 and 4 (highly and high) in respect of adoption of GSCS and 3, 2 and 1 (moderate, rarely and not at all) for those categorized as not adopting. Index measures to assign value based on how much of the concept being measured is associated with an observation is an appropriate approach (Zikmund et al, 2010).

The measure of central tendency for this study was median and the frequencies of the ordered scores were presented in percentages. Median is the most appropriate locator of center for ordinal data since it is resistant to extreme scores, thereby making it a preferred measure for Likert type data wherefore the distributions are not normal (Cooper et al, 2011).

Descriptive Results

Business Sectors and Title of Officer Involved in Supply Chain/Environment

This study targeted five sectors namely Building and Construction, Energy, Electrical and Electronics, Food and Beverage, Pharmaceutical and Medical, and Plastics and Rubber. The firms were randomly identified from a pull of twelve sectors excluding the services sector which was outside the scope of this study. Questionnaires were distributed proportionately and all those surveyed in Building and Construction and Energy, Electrical and Electronics responded. Food and beverage had the highest proportion but this sector is highly heterogeneous and one of the few sectors that relied on raw material produced locally. This include agricultural produce and water.

The survey reveals that those who filled the questionnaires were in management and most of them had a role in either Procurement/Supply Chain, Production or Environment.

Firm size

The size of the firm was assessed by two parameters which include number of employees and annual turnover. Employees play a pivotal role in strategy adoption which is in line with the institutional theory. Internal stakeholders is hypothesized as a driver of green supply chain management in this study. The results revealed that ...and hence the need to evaluate the firm size in terms of number of employees and even decision makers. Kenya is not highly industrialized and most manufacturing firms require large numbers of human labour. This variable aimed to assess the influence of top management and employees on issues whose solution would be sought through adoption of green supply chain strategy.

Factors Influencing Internal Stakeholders
Internal stakeholders reaction to green issues was assessed using the variables in table 4.1 below.

<table>
<thead>
<tr>
<th>Internal Stakeholders Influence (Likert scale 5-1)</th>
<th>Very high</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Not at all</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Priority of CEO and/or Board of Directors</td>
<td>42.9</td>
<td>20.0</td>
<td>27.1</td>
<td>4.3</td>
<td>5.7</td>
<td>4</td>
</tr>
<tr>
<td>ii. High cost of energy</td>
<td>30.0</td>
<td>35.7</td>
<td>17.1</td>
<td>10.0</td>
<td>7.1</td>
<td>4</td>
</tr>
<tr>
<td>iii. High cost of production inputs</td>
<td>32.9</td>
<td>25.7</td>
<td>25.7</td>
<td>5.7</td>
<td>10.0</td>
<td>4</td>
</tr>
<tr>
<td>iv. Employee turnover/low morale related to green issues</td>
<td>11.4</td>
<td>17.1</td>
<td>31.4</td>
<td>12.9</td>
<td>27.1</td>
<td>3</td>
</tr>
<tr>
<td>v. Complaints due to high health and safety premiums</td>
<td>11.9</td>
<td>31.3</td>
<td>22.4</td>
<td>14.9</td>
<td>19.4</td>
<td>3</td>
</tr>
<tr>
<td>vi. Employee level of awareness of environmental issues</td>
<td>8.7</td>
<td>17.4</td>
<td>30.4</td>
<td>27.5</td>
<td>15.9</td>
<td>3</td>
</tr>
<tr>
<td>vii. Firm’s desire to participate in climate change campaign and performance targets</td>
<td>22.9</td>
<td>22.9</td>
<td>35.7</td>
<td>14.3</td>
<td>4.3</td>
<td>3</td>
</tr>
<tr>
<td>viii. Marketing departments environmental priority for green image</td>
<td>28.6</td>
<td>25.7</td>
<td>21.4</td>
<td>14.3</td>
<td>10.0</td>
<td>4</td>
</tr>
<tr>
<td>ix. Increased hype for products with green element</td>
<td>18.8</td>
<td>24.6</td>
<td>29.0</td>
<td>18.8</td>
<td>8.7</td>
<td>3</td>
</tr>
<tr>
<td><strong>Average percentages</strong></td>
<td><strong>23.1</strong></td>
<td><strong>24.5</strong></td>
<td><strong>26.7</strong></td>
<td><strong>13.6</strong></td>
<td><strong>12.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

(i) Priority of the CEO and/or Board of Directors

On Likert scale of 5 where 5 is very high influence and 1 is not at all in respect of pressure to adopt green strategy/practices it was found that 62.9% of the respondents agreed that the CEO was a force to reckon with. The median for this response was 4 out of 5.

(ii) High Cost of energy and Production

The results indicated revealed that firms termed high cost of energy and production as a pressure which would be mitigated by a adoption of green supply chain strategy. Those responding to very high and high were 65% with a median of 4.

(iii) Pressure from Employees
The response on employees in relation to turnover and morale due to green issues, complaints due to health and safety premiums and employee level of awareness of environmental issues all had below 11% for very high influence and a median of 3 signifying that the issue at hand was not an effective indicator of pressure to adopt.

(iv) Marketing departments environmental priority

The results of our study reveal that 65% percent agree at combined very high and high that the department influenced adoption of green practices with a median of 4.

(vii) Firms desire to participate in climate change campaign and performance

Only 45% responded to very high and high to pressure or influence to act in this way in respect of green issues affecting their firm. The median was 3 which signifies moderate influence.

(Viii) Increased hype for products with green element

From the production point of view, the results indicate that only about 43% were influenced by green issues to produce products with a green element. The median was 3 represents moderate influence.
Green Projects and Practices

Adoption of green supply chain strategy was obtained through evaluation of extent to which firms practiced sixteen attributes of green supply chain mix. The results are illustrated in table 4.2 below.

**Table 4.2: Adoption of Green Supply Chain Strategy**

<table>
<thead>
<tr>
<th>Green projects and practices</th>
<th>Very high</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Not at all</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Eliminate/reduce hazardous/toxic materials from products</td>
<td>37.7</td>
<td>27.5</td>
<td>11.6</td>
<td>11.6</td>
<td>11.6</td>
<td>4</td>
</tr>
<tr>
<td>ii. Eliminate/reduce hazardous/toxic chemicals from manufacturing processes</td>
<td>38.6</td>
<td>30.0</td>
<td>8.6</td>
<td>7.1</td>
<td>15.7</td>
<td>4</td>
</tr>
<tr>
<td>iii. Implement design for environment practices in product development and to reduce, or repurpose manufacturing waste</td>
<td>32.9</td>
<td>28.6</td>
<td>24.3</td>
<td>4.3</td>
<td>10.0</td>
<td>4</td>
</tr>
<tr>
<td>iv. Reduce energy consumption in manufacturing and buildings</td>
<td>41.4</td>
<td>27.1</td>
<td>14.3</td>
<td>11.4</td>
<td>5.7</td>
<td>4</td>
</tr>
<tr>
<td>v. Increase the use of renewable energy sources e.g. solar, wind, geothermal</td>
<td>24.3</td>
<td>24.3</td>
<td>28.6</td>
<td>4.3</td>
<td>18.6</td>
<td>3</td>
</tr>
<tr>
<td>vi. Optimize transportation operations to reduce carbon footprint</td>
<td>25.7</td>
<td>28.6</td>
<td>22.9</td>
<td>11.4</td>
<td>11.4</td>
<td>3</td>
</tr>
<tr>
<td>vii. Recycle returned products or scrap material</td>
<td>35.7</td>
<td>24.3</td>
<td>15.7</td>
<td>10.0</td>
<td>14.3</td>
<td>4</td>
</tr>
<tr>
<td>viii. Reduce packaging</td>
<td>21.4</td>
<td>25.7</td>
<td>22.9</td>
<td>11.4</td>
<td>18.6</td>
<td>3</td>
</tr>
<tr>
<td>ix. ISO certification e.g ISO 14001, ISO 22000 and ISO 9000:2008</td>
<td>27.5</td>
<td>23.2</td>
<td>18.8</td>
<td>15.9</td>
<td>14.5</td>
<td>4</td>
</tr>
<tr>
<td>x. Improved capacity utilization</td>
<td>24.6</td>
<td>31.9</td>
<td>26.1</td>
<td>8.7</td>
<td>8.7</td>
<td>4</td>
</tr>
<tr>
<td>xi. Increased campaign for green products, processes and activities e.g. tree planting</td>
<td>24.3</td>
<td>27.1</td>
<td>25.7</td>
<td>8.6</td>
<td>14.3</td>
<td>4</td>
</tr>
<tr>
<td>xii. Use of green criteria in technical specifications of contracts</td>
<td>14.5</td>
<td>23.2</td>
<td>29.0</td>
<td>20.3</td>
<td>13.0</td>
<td>3</td>
</tr>
<tr>
<td>xiii. Ethical and responsible tendering approaches</td>
<td>31.4</td>
<td>21.4</td>
<td>20.0</td>
<td>18.6</td>
<td>8.6</td>
<td>4</td>
</tr>
<tr>
<td>xiv. New company environmental policy</td>
<td>28.6</td>
<td>20.0</td>
<td>31.4</td>
<td>10.0</td>
<td>10.0</td>
<td>3</td>
</tr>
<tr>
<td>xv. Participation in award winning environmental programmes</td>
<td>25.7</td>
<td>17.1</td>
<td>25.7</td>
<td>20.0</td>
<td>11.4</td>
<td>3</td>
</tr>
<tr>
<td>xvi. Increased green awareness training and campaigns</td>
<td>25.7</td>
<td>17.1</td>
<td>31.4</td>
<td>18.6</td>
<td>7.1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Averages percentages**

|            | 28.6 | 24.8 | 22.3 | 12.0 | 12.0 |
The above results support the notion that green supply chain practices represented by the sixteen factors scored relatively well and it can be construed that Kenya manufacturing firms have adopted green supply chain strategies to some extent. The study reviews that out of factors considered five had outstanding response where combined very high and high is above 60 percent. These include: eliminate/reduce hazardous/toxic materials from products, Eliminate/reduce hazardous/toxic chemicals from manufacturing processes, implement design for environment practices in product development and to reduce, or repurpose manufacturing waste, reduce energy consumption in manufacturing and buildings and recycle retuned products or scrap material. Overall 53.4 percent responded to very high and high in respect to the practices that constitute GSCS.

Factor analysis was performed to help eliminate factors that did not have considerable contribution, but the outcome was positive for all items considered since they were above 0.555. After factor analysis, average means were computed and the results which fell between 4 and 2.5 were consistent with the median an indication that despite the heterogeneity of the firms studied, certain factors were viewed by the respondents the same way.

**Binary Logistic Regression**

Regression analysis helps a researcher to understand both the strength of the relationship and the impact of the independent variable on the dependent variable (Johnson, 2010). Logistic regression for instance gives an opportunity to predict factors not included in the survey sample as was revealed to some extent by some of the open ended questions responded to in this study on drivers of adoption of GSCS. Logistic regression allows the researcher to predict a discrete outcome from a set of continuous, discrete, or dichotomous (Sekaran and Bougie, 2009). GSCS adoption is choice manufacturing firms have to make faced with the dynamics of the business environment in which they operate, moreover, those that relate to green issues. The assessment of the ratio of the probability of adopting to the probability that a firm will not adopt is of significance in this study. The random component is Y with a binomial probability distribution, whereas the systematic component is the continuous predictor represented by X, hence the logit transformation $y = \ln \left( \frac{X}{1-X} \right) = \logit(x)$.

The objective of the study was to assess adoption of green supply chain strategy categorically. Those firms adopting and those not adopting. To transform the dependent variable to a dichotomous measure, the results of those scoring at very high and high were combined and denoted by one (1) and the reminder which was moderate, low and not at all were combined as another measure denoted by zero (0). The first step given by the classification table output revealed that out of 70 cases 51% fell under the category of those adopting. A logistic regression conducted find the best combination of drivers for adoption of green supply chain strategy and the results revealed that internal stakeholders was a major driver. The results of regression of internal stakeholders only show Nagelkerke R square results of 0.548 and Cox & Snell at 0.411.
an indication that more that 50 percent of the prediction was explained by the present study results.

The logistic regression output for the dependent variable given by variables not in the equation output yield a score of 28.51 with 1 degree of freedom and a significance level of 0.00. Hosmer and Lemeshow test result of above 0.05 were obtained hence a reliable measure of model fitness. The model fit was found to be good. The effect of the independent variable internal stakeholder as a driver of green supply chain strategy is given by the outcome of the logistic regression as indicated on table 4.2 below.

Table 4.3: Logistic Regression output for Internal Stakeholders Influence

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3.150</td>
<td>.759</td>
<td>17.206</td>
<td>1</td>
<td>.000</td>
<td>23.329</td>
</tr>
<tr>
<td>Constant</td>
<td>-10.581</td>
<td>2.613</td>
<td>16.396</td>
<td>1</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Variable(s) entered on step 1: X.

The likelihood function was used for estimating the probability of the data collected on the assumption that the probability of the observed values of the dependent variable would be predicted from the observed values of the independent variable. The model took the form presented below:

\[
\ln (Y) = \alpha_0 + \alpha_1 X_1 + \epsilon. \quad \text{Where,}
\]

\(Y = \) the odds ratio - adoption of green supply chain strategy. 1 to denote those adopting the strategy, and 0 to denote otherwise

\(\ln(Y)\) denotes = natural logarithm of the ratio of the odds ratio

\(X_1\) denotes = Internal stakeholders

\(\alpha_1\) denotes = the coefficient, \(\alpha\) constant and \(\epsilon\), the error term.

\(\epsilon\)-is the error term assumed to be independent to follow some distribution.

Substituting for values obtained from the computation we get the following equation:

\[
\ln Y_1 = -10.58 + 3.15X + 0.76.
\]

The odds ratios for (X) Internal Stakeholders is 23 which means that one point increase in the scale for measuring respondents’ influence of internal stakeholders to adopt green supply chain strategy increases odds of adoption by a multiplicative factor of 23. The beta coefficient is 3.15 and the results reveal that the variable has high probability and it is statistically significant at 0.00, where significance test value is \(p<0.05\).

The null hypothesis for this study was stated as follows:
H₀ = Internal stakeholders do not contribute to adoption of green supply chain strategy by manufacturing firms in Kenya.

Internal stakeholders has a calculated p-value of 0.00 and Exp(β) of 23. According to these survey results, there is substantial evidence to reject the null hypothesis and conclude that internal stakeholders contribute to adoption of green supply chain strategy by manufacturing firms in Kenya.

**Research Question**

Do Internal Stakeholders contribute to adoption of green supply chain strategy by manufacturing firms in Kenya?

The descriptive statistics show that internal stakeholders had a role to play in decisions for strategy related to green issues facing an organization and its environment in general. Priority of CEO and/or Board of Directors, high cost of production inputs and high energy costs were major factors scored at very highly and high at over 60% as per the results of our study. However, the factor on employee level of awareness of environmental issues had the lowest influence at 8.7% of very high influence. Increased green awareness training and campaigns for green practice were not highly practiced. Additionally, the results revealed lack of involvement of employee by management as one of the factors that hindered adoption of green strategy. These results are consistent with similar studies in the area of influence of stakeholders on adoption of environmental strategy or green supply chain strategy to some extent. Notably some studies which aimed at assessing stakeholder pressures as determinants of CSR strategic choice, found evidence about firms joining self-regulatory codes due to stakeholder pressure (Chien, 2014). Study of the Swedish energy manufactures, revealed that environmental strategy was influenced highly by top management, shareholders and employees (Linblom and Ohlsson, 2011).

This generation and generations to come must have a compelling and ever more urgent duty of stewardship to take care of the natural environment and resources on which economic activity and social fabric depends (Holt and Ghobadian, 2009). This proposition seems to hold as reviewed by our study where internal stakeholder driver was found to be the most influential. A study revealed that in order to greening a pharmaceutical supply chain in UK, a strategy that aimed at preventing pharmaceutical waste and effective disposal calls for every producer to be duty bound (Xie and Breen, 2012). Pharmaceutical firms were included in this study and based on the positive outcome of the internal stakeholders influence on firms, it can be argued that Kenyan firms also feel duty bound to facilitate safe handling of waste emanating from their processes. Internal strategic motivations were the most significant predictors of adoption of Green Supply Chain Management practices as posited by (Hajikhani, Wahiza and Idris, 2012).

**5.0 CONCLUSIONS AND RECOMMENDATIONS**
The purpose of the study was to assess to the extent to which internal pressures driven by demand for eco-solutions influenced manufacturing firms to implement green supply chain practices and by extension explore factors hindering adoption of the strategy. Green issues had high influence on adoption of GSCS in Kenya where internal drivers were noted to have a significant influence. The null hypotheses was rejected following significant logistic regression results which proved our proposition that adoption of green supply chain strategy has a relationship with green issues affecting an organization. The study showed that green issues are top of the global agenda and both the government and the firms are beginning to respond both proactively and reactively.

Studies have shown that the success of any strategy lies with the leadership and top management support. The empirical evidence on top management displayed overwhelming positive results with the Chief Executive Officer topping the list. The level of employee awareness employee absenteeism or turnover due to environmental related issues were low despite employee being a key internal stakeholder.

The objective of this study variable was confirmed by the results which are in tandem with the institutional theory and literature reviewed in respect of internal stakeholders and strategic choice of an organization. The results confirm the notion that fundamentals that influence firms to adopt GSCS differs from country to country and more so with level of development. Developed countries were way ahead in implementing strategies relating more to external drivers whereas developing countries concentrated more with responding to internal drivers. Supply chain management studies were not many for developing countries and low developed countries nor are empirical studies many in the area where the green component is added as envisaged by (Sachan et al., 2005). This study has found that adoption of GSCS is not just a buzzword but an emerging research area that calls for in-depth research to help the country focus more strategically to the global environmental agenda.

**Recommendations**

The findings of this study and the implications of the green issues on adoption of green supply chain strategy by manufacturing firms in Kenya lead to a number of recommendations. The manufacturing firms studied fell into five different sectors and in terms of ownership, some were multinationals, others public and yet others private. A study with a moderating variable for type or ownership of firm is recommended. Internal stakeholders were found to be the top drivers of an eco-friendly system in Kenya. Research to find how governments can leverage on internal stakeholders to improve environmental sustainability is recommended. The study noted low awareness levels of green issues and this opens up a research area in respect to the role of capacity building for a green economy. Managerial recommendations include the need to benchmark and to set environmental internal standards to address the issues of employee involvement and customer education and training of suppliers on green issues.
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