

Green supply chain management as a competitive tool in the fast-moving consumer goods manufacturing industry

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Keywords

Green; Fast-Moving Consumer Goods; supply chain management; manufacturing industry; Nigeria.

Abstract

Global competitiveness and the adoption of new business strategies have placed most manufacturing industries under pressure, and this has led organisations to adopt different strategies in their supply chain (SC) processes to enhance their competitiveness. Included in these are green manufacturing, business process re-engineering, and total quality management. The implementation and adoption of green supply chain management (GSCM) remains a problem in developing countries, including Nigeria's Fast-Moving Consumer Goods (FMCG) manufacturing industry. An exploratory study was therefore conducted on green SC initiatives within the FMCG manufacturing industry in Nigeria to establish how this has affected both its performance and competitive advantage. Primary data were collected from 41 selected respondents at a FMCG manufacturing industry based in Lagos, Nigeria using quantitative methodology through the distribution of a questionnaire. A significant number of respondents (32 of 41; 77.54 percent) agreed that the implementation and adoption of green SC initiatives would enhance organisational performance, and the proper integration of all processes used for GSCM, which practice can lead to enhanced competitive advantage. The results furthermore indicate that the success of GSCM in the FMCG manufacturing industry requires a collaborative approach which differs from those traditionally used for SCs.

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First submission received: 7th November 2017

Revised submission received: 2nd January 2018

Accepted: 19th March 2018

1.0 Introduction

Sustainability is a major cause of concern for the various stakeholders in supply chain management (SCM), because of its critical significance to the success of businesses in all areas of the world. Customers and non-governmental organisations (NGOs), for example, believe sustainability has an environmental effect on products available in the market. The advantages of applying GSCM in the manufacturing industry are therefore considerable, and highly relevant for enhancing competitiveness. It is apparent that most managers in organisations are aware of the impact on their SC processes, and the threat its endangerment could pose to their operations (Beamon 1999).

Organisations are thus under intense pressure regarding how to manage the impact of their operations on the environment; as pointed out, for example by Zhu and Sarkis (2004); Vachon and Klassen (2006); Poirier *et al.* (2008); Boyer *et al.* (2009); and Sarkis *et al.* (2011). These authors highlight that factors driving the adoption and implementation of GSCM by organisations is attributable to the intense motivations of the various stakeholders, primarily those of government, consumers and non-profit organisations. Furthermore, findings from their studies point to the fact that proper collaboration amongst stakeholders involved in GSCM, and consideration for the environmental impact of manufacturing processes, will enhance organisational performance and lead to improved competitive advantage.

To minimise the impact of their activities on the environment, organisations have therefore been putting policies in place that will reduce the effects of environmental impact throughout the lifecycles of their products (Zsidisin & Siferd 2001). The main motive of GSCM is to ensure that all the processes involved in product manufacture are not harmful to the environment, and that materials can be re-used, recycled, and are non-toxic (Min and Galle 2001)

This paper undertakes an analysis of critical factors affecting the implementation and adoption of a GSCM strategy in FMCG manufacturing industry production processes in Nigeria, and how this can assist in lessening environmental pollution, and in waste reduction and enhancing competitive advantage.

Sarkis (2006) argues that many of the measures being adopted are focused on managing environmental impact, rather than being strategies that will help to reduce pollution. In addition, due consideration should be shown for the inability of this conservation method to reduce or eliminate pollution without merely transforming pollutants into other forms. In view of this, organisations are now beginning to consider their external environments, with the aim of enabling waste reduction and pollution, for propagating a green SC to all stakeholders (Canning & Hanmer-Lloyd 2001; Vachon & Klassen 2006). As a result, organisations in developing countries are implementing environmental policies which align more closely with those of their clients and rivals in other developed countries, due largely to the pressures exerted by the phenomenon of globalisation (Christmann & Taylor 2001).

Green SC strategies are considered of extreme importance for organisational effectiveness, since they involve the coordination of all processes to assist in winning competitive advantage over rival companies (Pamela & Pietro 2011). Wyatt (2013) states that SC strategies alone are not adequate for organisations to attain competitive advantage, and it is therefore also important for manufacturers, shipping partners and customers to consider and make use of these strategies to remain competitive.

This paper is divided into the following sections: firstly, the literature review, followed by forces driving GSCM implementation in the manufacturing industry, then the research methodology, the research findings, managerial interpretation and theoretical implications, and finally, the study's recommendations and conclusions.

2.0 Literature review

GSCM, as defined by Kumar and Chandrakar (2012), is the use by organisations of environmentally friendly materials for production, and the reuse of waste materials after consumption, which thereby fosters sustainable SCs. Moreover, Srivastava (2007) mentions that GSCM has to do with consideration for the environment during product design, the procurement of materials, the production process, the delivery of products to customers, and product recycling. The literature further reveals that GSCM will assist in enhancing the profitability of organisations (Kumar *et al.* 2012; Rao & Holt 2005; Green *et al.* 2012).

Production has a substantial impact on the environment, which results in explicit expectations from various stakeholders (Heidrich & Tiwary 2013; Kumar *et al.* 2012). Increased societal awareness has, in addition, raised expectations of production needing to be environmentally sustainable; as a result, organisations are now beginning to develop strategies that make use of environmentally friendly materials for their production and recycling (Heidrich & Tiwary 2013).

The European Union (EU) has instituted legislation on environmental pollution and the emission of hazardous substances by both industries and consumers and is committed to the full implementation of these guidelines by 2020 (Europa 2015). The aim of these initiatives is to ensure environmentally friendly production, use and disposal of goods, and the promotion of competitiveness among organisations. According to Cosimato and Troisi (2015), the term "green" is used as an adjective to describe environmentally friendly initiatives adopted for production. Vijayvargy and Agarwal (2014) point out that for GSCM to succeed, there must be buy-in by top management of organisations to drive such initiatives.

There are many reasons why organisations embark on GSCM; for example, government policies, the requirements of various stakeholders, both internal and external to organisation (Delmans & Toffel 2004), and organisational ethics (Carter & Jennings 2002). The following factors influence the implementation of GSCM by organisations: regulatory measures (Hall 2000); competition (Zhu & Sarkis, 2004); customer expectations (Tate *et al.* 2010); and corporate social responsibility (Murphy & Poist 2003).

Rules and regulations, in the form of standard policies, procedures and protocols set in place by government and other regulatory bodies, serve as catalysts which compel organisations to consider their impact on the environment (Hall 2000). Measures instituted by governments to guide against unethical behaviour that could affect the environment may range from fines levied for infractions to the complete closure of organisations (Riverta *et al.* 2006).

Due to the enforcement of laws, rules and regulations, there has been an increased awareness of environmental issues amongst organisations globally, which has brought into being improved environmental management practices (Sarkis *et al.* 2011). As a result, such awareness and practices have spread to organisations in developing countries, with the level of awareness having increased to a point where organisations are pressed to surpass the expectations of regulatory bodies (Clemens & Douglas 2006). Zhu and Sarkis (2004) confirm how developing countries have implemented regulations which have enabled organisations to exceed local and global standards and that, in turn, have encouraged manufacturers to adopt GSCM, which has impacted positively on their performance.

Organisations constantly contend with the various challenges caused by competition, including those posed by environmental professionals (Zhu & Sarkis 2004). As a result, operations are carried out in such a manner that their consciousness of the environment allows them to draw ahead of competitors and remain competitive (Carter & Ellram 1998; Canning & Hanmer-Lloyd 2001).

Some of the concerns raised by customers question the environmental impact of goods produced by manufacturing companies, and how they cultivate or adopt a culture of green initiatives in product development (Tate *et al.* 2010). It has been confirmed that a push from downstream operators in the SC now also serves as a motivator for organisations to adopt GSCM (Christmann & Taylor 2001; Wolf 2011).

Organisations that are responsible for the environments in which they operate will command good reputations, and this determines whether the public accepts such entities. Murphy and Poist (2003) indicate that multinational organisations have adopted cultures of being socially responsible, and therefore consistently practice generally acceptable green initiatives to maintain good reputations and remain environmentally friendly in their production processes.

Research conducted by Chin-Chun *et al.* (2013) regarding those organisational attributes making them conscious of the environment, and which may assist in developing GSCM, resulted in a proposed model to test the elements of those attributes enabling GSCM adoption by manufacturing organisations. The study findings confirm that pressure from competitors and customers, as well as corporate responsibility and policies, are important elements motivating manufacturing organisations to adopt GSCM.

Understanding the influence of GSCM practices on organisational performance in manufacturing industries is the core message of a paper by Kenneth *et al.* (2012), which describes their study based on a model used to incorporate GSCM, through collaboration between manufacturers and their suppliers, to enhance sustainability. Data were analysed using a structural equation model to demonstrate the relationship between manufacturers, suppliers and customers, and gain an understanding of how their relationships enhance the sustainability of their SCs. The results of the study by Kenneth *et al.* (2012) show that the adoption of GSCM improves economic, environmental and operational performance.

The idea of GSCM has gained wider attention globally because of its importance for organisational performance. When implemented, the assumption is that GSCM will have a positive impact on both organisational performance and competitive advantage. GSCM is further investigated by Chan *et al.* (2011) in a study conducted on numerous companies from eight industry sectors in Taiwan. GSCM was presented as a topic in a questionnaire-based study, which collected data with the purpose of determining the impact of relationships between green suppliers and green innovations on organisational performance and competitive advantage using a structural equation model. The results of the study by Chan *et al.* (2011) indicate that when green initiatives are implemented across the SC process by both suppliers and manufacturers, this results in their improved environmental sustainability and increase competitive advantage.

Azevedo *et al.* (2011) focus on determining the impact of SCM practices on organisational performance by using the variables of green purchasing, green suppliers and green designers, to ascertain how all these variables can work together to reduce product impact on the environment in automotive industries in Portugal. A model was developed to establish the relationships amongst the variables, with findings indicating that GSCM has a positive effect on quality, customer satisfaction, and the efficiency of the organisations investigated.

Similarly, the influence of organisational policies and practices regarding logistics is the focus of the paper by Dey *et al.* (2011), in which they seek to identify and provide recommendations to organisations on ways in which to make their operations more sustainable. Based on this study (Dey *et al.* 2011), logistics were identified as crucial to proper implementation of sustainability strategy for any organisation, because of the cost involved, the opportunity to recognise and remove inefficiency within their operations, and improved pollution reduction. Further recommendations include organisations having an important role to play in planning environmental sustainability, so they can be socially responsible in the way they consume energy and materials and dispose of products which have reached their end-of-life.

Additionally, Jayaraman *et al.* (2012) explore the advantages derived by two ISO 14001-certified companies in India, while confirming the benefits they gained through the implementation of GSCM. The results of this investigation reveal that, when an organisational process is optimised, improved sustainability follows, and environmental consciousness during production then results in greater operational effectiveness.

Poor GSCM implementation, and the effects of non-profitable use of electricity on operational sustainability, have a negative impact on organisational performance. Research carried out by Aflaki *et al.* (2012), using a case study of the large manufacturing industry to ascertain the effects of energy usage on operational effectiveness, find that sustainable strategies adopted for the operational backend are crucial to the success of any operation. Furthermore, the study findings reveal three important factors which motivate energy-efficient projects, namely: savings intensity; greener image; and complications within projects.

The adoption and implementation of GSCM in the manufacturing industry have become critical for the achievement of organisational performance, and in turn, improve competitive advantage. Literature reviewed indicates that there are several approaches to implementation and adoption of GSCM in the manufacturing industry. Studies conducted by Chin-Chun *et al.* (2013), Kenneth *et al.* (2012), Azevedo *et al.* (2011), Aflaki *et al.* (2012), and Chan *et al.* (2011), focus specifically on the application of GSCM across various organisations. These studies use structural equation modelling and case studies to test the relationships between green purchasing, green suppliers, green logistics, green manufacturing, operational effectiveness, energy efficiency, and green designers, to ascertain how all these variables can work together to reduce product impact on the environment.

Another study by Vijayvargy and Agarwal (2014) points out that for GSCM to be successfully implemented and adopted, there must be buy-in from the top management of organisations who drive such initiatives. Furthermore, Jayaraman, Singh and Anandnarayan (2012) explore the benefits derived from the implementation of GSCM through the effects of green marketing on consumer purchasing behaviours, using a questionnaire-based survey, which led to the development of a proposed conceptual framework to be used for their investigation.

All these methods can yield valid results, as noted by each study examined, but green managerial innovation appears to be of more critical importance to the successful implementation and adoption of GSCM, because such managers are responsible for the performance of the organisation at which they work. In addition, since GSCM is not only implemented within one business unit, but across the whole of organisations, the resources required to achieve it are necessarily enormous, and require the involvement of top-level management for its success.

The results from this study, concerning whether operational effectiveness enhances performance and increases competitive advantage, indicate that when operations are not fully integrated within all organisational units, this may not lead to improved performance. Opinions regarding this differ, however, based on respondent feedback from the studies conducted by various authors, and this could be due to an inadequate understanding of the impact of operational procedures on the environment by staff, or because non-green processes are being used during the manufacture of goods.

In addition, most of the studies looked at focus on organisations that are not part of the FMCG manufacturing industry, which may be the cause of this variance. Hence, this could be subject of specific further research, using different methods of data collection and analysis.

3.0 Research methodology

The choice of research design for the study depended on such factors as the level of control the researcher had on the phenomena being studied, the focus and purpose of the study, and the time available for collection of the type of data required. Furthermore, literature regarding previous studies which adopted questionnaire-based surveys was reviewed (Kim2007; Anuja *et al.* 2015; Mafini & Muposhi 2017). With consideration for the foregoing, a quantitative method of data collection was used in this study for the collection of primary data. Yilmaz (2013) asserts that a quantitative research approach can describe phenomena consistent with the numerical data analysed "by means of mathematically-based methods, especially statistics".

A questionnaire was developed for data collection, and this measuring instrument was pre-tested to ensure reliability, due to its ability to provide a quick, inexpensive, efficient and accurate means of collecting information from respondents (Zikmund *et al.* 2010). In addition, a questionnaire saves time, since it can be administered concurrently, and contains standardised wording, with each respondent exposed to the same sets of questions to eliminate bias.

The questions were freshly-formulated and designed in Likert-scale format based on the literature reviewed on the various aspects of GSCM adoption and implementation, thereby presenting a series of attitudes towards a variable or object, with numerical values assigned ranging from "strongly disagree" to "strongly agree" (McDaniel & Gates 2001). The questionnaire was formulated specifically to ensure that

respondents were not frustrated due to misunderstandings caused by incorrect wording (Cooper &Schindler 2003).

A sample population was selected in collaboration with a representative appointed by the company in question as the lead in-house person for this research. Stratified random sampling was utilised for respondent selection, with company departments being the stratification factor. Sekaran (2010) indicates that this is one of the most efficient sampling methods available, since it is possible for the researcher to reduce the quantity of data collected by dividing the population into sub-groups, where each stratum is predetermined, rather than collecting data from all possible or available cases.

Respondents were drawn randomly from the following departments: supply chain management; manufacturing; marketing; sales; logistics; finance; procurement; production; contracting; and in-store personnel. These population groups were targeted because they possess distinct and varied characteristics, and are of different sizes, which is appropriate to the dynamics of the research problem, questions and objectives. Sekaran (2010), state that a sample size ranging from 20 to 50 respondents can be adjudged as being adequate for most research; hence a sample size of 65 was considered sufficient for the purposes of this study.

For the purposes of establishing the validity and reliability of the research instrument, a pre-test should be conducted to establish a questionnaire's suitability before administering it to all respondents (Fink 2010). In validating reliability, the questionnaire was pre-tested on ten respondents, of which eight returned completed questionnaires after two weeks. The responses were analysed using Cronbach's Alpha test, with a score of 0.879 obtained, and from this result the reliability of the instrument was established. Research instruments are considered reliable when they provide consistent results over time, where the instrument is repeatedly applied. For reliability, a Cronbach's Alpha average of this coefficient should vary between 0.0 and 1.0, with a value of 0.6 and below suggesting unsatisfactory internal consistency reliability (Sekaran 2010).

The questionnaire was checked by a professional statistician, and by experienced academic researchers in the field of GSCM, and professional SC within organisations, to ensure that it would be simple for respondents to understand. The pre-test also assisted in identifying and correcting errors before final administration to ensure that the instrument covered all characteristics of the problem being studied, and that the respondents understood the content of the questionnaire, and how it related to the research objectives.

Sixty-five questionnaires were personally administered, which allowed clarification to be provided for issues raised by respondents where necessary. A total of 50 questionnaires were returned, which can be attributed to the busy work schedules of some of the staff, who consequently did not complete their questionnaires during the time allocated, with others simply not being interested in participating. Of the 50 questionnaires returned, nine were found to be incomplete and were therefore rejected and not included in the data sets used for analysis. Hence, 41 of the returned questionnaires were confirmed to be valid and used for final data analysis in this study.

For quantitative data analysis and reported findings, mathematical models and statistics are made use of (Yilmaz 2013). Data analysis entails the reduction of field data obtained in such a manner that it is understandable, and easily processed using statistical means (Zikmund *et al.* 2010). Data analysis also involves interpretation, and the drawing of conclusions from data collected, with the reduction of the entire data set to a reasonable size, thereby enabling the creation of summaries, and the identification of patterns through the application of the statistical process (Cooper &Schindler 2003).

Application of statistical means to analyse data usually results in the drawing of frequencies for advanced variance analysis, which may also include regression analysis (Zikmund *et al.* 2010). Therefore, for this study, data were first screened to identify missing items, where necessary, and were then captured to computer using Microsoft Excel, based on the respective codes assigned to questions. Data were analysed using the Statistical Package for Social Sciences, Version 22.0. Descriptive statistical analyses were conducted, and tables, charts, graphs and frequencies generated to further guide and inform the study's findings.

4.0 Research findings

A survey was conducted on 41 selected respondents at a FMCG manufacturing company in Lagos, Nigeria. The study findings are tabulated as follows:

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Total		Mean	Std. Deviation
	N	%	n	%	n	%	N	%	n	%	N	%		
Business sustainability through cost effective power consumption	0	0.0%	0	0.0%	3	7.3%	28	68.3%	10	24.4%	41	100.0%	4.17	.543
Logistics	1	2.4%	0	0.0%	3	7.3%	25	61.0%	12	29.3%	41	100.0%	4.15	.760
Culture and organisational effectiveness	0	0.0%	2	4.9%	5	12.2%	20	48.8%	14	34.1%	41	100.0%	4.12	.812
Procurement and sourcing processes	1	2.4%	5	12.2%	12	29.3%	21	51.2%	2	4.9%	41	100.0%	3.44	.867
Supplier relationship/partnership	1	2.4%	3	7.3%	5	12.2%	25	61.0%	7	17.1%	41	100.0%	3.83	.892
Stakeholder collaboration	1	2.4%	2	4.9%	4	9.8%	26	63.4%	8	19.5%	41	100.0%	3.93	.848
Stakeholder engagement in product development	0	0.0%	2	4.9%	10	24.4%	21	51.2%	8	19.5%	41	100.0%	3.85	.792
Operational issues and constraints	2	4.9%	6	14.6%	15	36.6%	14	34.1%	4	9.8%	41	100.0%	3.29	1.006
Leadership effectiveness	1	2.4%	2	4.9%	2	4.9%	26	63.4%	10	24.4%	41	100.0%	4.02	.851
Production effectiveness through green initiatives	0	0.0%	2	4.9%	2	4.9%	29	70.7%	8	19.5%	41	100.0%	4.05	.669

Table 1: Frequency distribution of questions relating to tested variables

The study findings presented in Table 1 indicate that most variables tested were significant in nature. Descriptive statistics were used to ascertain the significance of the results based on respondent feedback from the questionnaire using frequencies and percentages.

Business sustainability through cost-effective power consumption: Study findings indicate that a majority (92.7 percent) of respondents agreed/strongly agreed that green power consumption will enable GSCM, while a minority (7.3 percent) remained neutral.

Green logistics: Logistics were identified as crucial to the proper implementation of a sustainability strategy for any organisation, with study findings showing that a majority (90.3 percent) of respondents indicated that green logistics will enhance GSCM, a small number (7.3 percent) remained neutral, and an even lesser number (2.4 percent) strongly disagreed.

Culture and organisational effectiveness: Less than half (48.8 percent) of respondents agreed that culture will play an important role in the achievement of GSCM, with more than a third (34.1 percent) strongly agreeing, fewer (12.2 percent) remaining neutral, and a small minority (4.9 percent) disagreeing.

Green procurement and sourcing process: The study findings indicate that more than half (51.2 percent) of respondents agreed that green procurement is practiced and will reduce environmental impact when sourcing materials, a small number (4.9 percent) strongly agreed, more than a quarter (29.3 percent) remained neutral, some (12.2 percent) indicated disagreement, and a very small number (2.4 percent) strongly disagreed.

Supplier relationship/partnership to foster green initiatives: The majority (78.1 percent) of respondents agreed/strongly agreed that good collaborations between partners will help to foster GSCM processes in the manufacturing industry, followed by a small number (12.2 percent) who remained neutral, a lesser number (7.3 percent) disagreeing, and a very small number (2.4 percent) who strongly disagreed.

Stakeholder collaboration to create awareness of green supply chains: Regarding collaboration between manufacturers and their suppliers to enhance sustainability, almost two-thirds (63.4 percent) of respondents agreed that adequate awareness of, and training for, GSCM will enhance organisational performance, followed by less than a quarter (19.5 percent) who strongly agreed, and a lesser number (9.8

percent) indicating they were neutral, while a few (4.9 percent) disagreed, and a minority (2.4 percent) strongly disagreed.

Stakeholder engagement in green product development: The study findings indicate that more than half (51.2 percent) of respondents agreed that adequate engagement of stakeholders during product development will enhance GSCM and improve organisational performance, followed by just below a quarter (24.4 percent) who were neutral, some (19.5 percent) who strongly agreed, and a lesser number (4.9 percent) who disagreed.

Leadership support to encourage green SCM: A majority (87.8 percent) of respondents agreed/strongly agreed that leadership support will promote GSCM and lead to organisational effectiveness and competitive advantage, followed by a minority (4.9 percent) who were neutral, and the same number (4.9 percent) who disagreed, with a small number (2.4 percent) indicating their strong disagreement.

Green production process: A majority (70.7 percent) of respondents agreed that green production processes, when adopted during manufacturing, will improve GSCM, with less than quarter (19.5 percent) strongly agreeing, a small number (4.9 percent) indicating they were neutral, and the same number (4.9 percent) who disagreed.

Operational effectiveness to support sustainable environment: More than a quarter (36.6 percent) of respondents indicated they were neutral as to whether enhanced operations alone will enable GSC and lead to improved performance, with a lesser number (34.1 percent) agreeing, followed by some (14.6 percent) who disagreed, and a smaller number (9.8 percent) who strongly agreed, while a minority (4.9 percent) strongly disagreed.

5.0 Interpretation

Most of the tested variables were significant, which attests to the fact that GSCM will enhance organisational performance and competitive advantage. This result is consistent with the results of the study carried out by Chan *et al.* (2011), conducted on numerous companies from eight industry sectors in Taiwan. It is therefore argued that when green initiatives are implemented across the SC process by both suppliers and manufacturers, this will result in improved environmental sustainability and increase competitive advantage.

Moreover, this is in alignment with the findings of studies carried out by scholars, such as: Kenneth *et al.* (2012); Chan *et al.* (2011); Azevedo *et al.* (2011); Dey *et al.* (2011); Jayaraman *et al.* (2012); and Aflaki *et al.* (2012). Findings from studies conducted by these researchers confirm that implementation and adoption of GSCM will enhance organisational effectiveness. However, a substantial number of respondents for the current study believed operational processes within the organisation conducted without collaboration with other units and processes will not foster green initiatives.

More than a third (34.1 percent) of respondent's resent have agreed that production operations within the organisation have an impact on GSCM, with a small number (9.8 percent) indicating they strongly agreed with this statement. The majority (36.6 percent) of respondents expressed their neutrality, however, with fewer (14.6 percent) disagreeing, and minority (4.9 percent) who strongly disagreed. These results run contrary to the assertion made by many of the findings present in literature that efficient operations alone cannot lead to organisational effectiveness, except when integrated with other SC functions.

This phenomenon could be due to the way organisations 'production operations are being handled, which may not foster effective GSCM. In addition, most of the studies carried out on GSCM focus on organisations which are not part of the FMCG manufacturing industry, which may explain this deviation. Alternatively, this may be since respondents were simply not aware of the impact of these operations on the achievement of GSCM, or could even be the result of many, yet unknown, factors which could form the basis for future studies.

6.0 Implications

The implications of the study's findings have ramifications for SCM theory and practice.

6.1 Implications for SCM theory

For the FMCG manufacturing industry to achieve effective green SCs, improved environmental impact, reduced costs, and increased sustainability and competitive advantage, all staff and relevant stakeholders need to obtain a clear understanding of pertinent theories to assist them in solving critical

problems encountered in their GSCM processes. New trajectories for green SCM strategies in FMCG manufacturing industries need to be proposed and implemented, and new concepts and theories regarding green SCMs should emphasise the important considerations of environmental impact and the green initiatives used to ameliorate this in their business practices.

6.2 Implications for GSCM practice

GSCM aims at reducing energy consumption and waste emissions (Li *et al.* 2010), and the implementation of green manufacturing practices is intended to decrease energy costs. Recycling materials, identifying wastes, and purchasing from green suppliers are simple ways to implement green manufacturing processes. Wyatt (2013) states that SC strategies alone are not adequate for organisations to attain competitive advantage, and a need therefore exists to consider environmental issues and integrate these into organisational processes. Included in these are: strategy formulation; production planning; procurement and material utilisation; reverse logistics; and, how organisations relate with their consumers.

Organisations need to find ways of dealing with environmental challenges through the adoption and implementation of green production strategies, new product development and customer relations, to remain competitive. SC managers should always be conscious of the cost implications of new laws and regulations, in addition to the high cost of defensive litigation, and the possibility of losing their place in the market to competitors. In addition to this is the consideration of being perceived as non-environmentally friendly by consumers, which could result in a loss of product acceptance due to perceived inaction from producers, along with the possibility of their non-compliance with regulations, and being compelled to comply with the threat of action that could be taken to protect the environment by the authorities.

The practical implications of this study will benefit those businesses in the FMCG manufacturing industry, and their relevant stakeholders, whose managers are properly educated regarding the cost benefits of green manufacturing, and of being socially responsible for the environment as part of the overall obligations they are required to fulfil.

7.0 Recommendations

The significance of GSCM cannot be overemphasised, because of its importance to the success of businesses in all parts of the world. For organisations to remain competitive, their GSCM must be incorporated into all production process activities, and consideration for the environment must be given highest priority. To be effective, organisations are beginning to partner with environmental professionals who assist them in carrying out environmental improvement projects, since to achieve these, they generally need to create internal departments which handle both environmental issues and corporate social responsibility, and which have an annual budget for the implementation of various projects.

In addition, education and training initiatives could be developed where stakeholders regularly assess how to become environmentally friendly in their business processes. Moreover, organisations could engage in environmental projects which are visible to everyone, thereby demonstrating their commitment to such initiatives. Advertisements could be broadcast on both or either radio or television, promoting the environmental policies and commitments of such organisations.

Senior management must fully support GSCM initiatives for them to be successful, and there by instil confidence in the minds of the various stakeholders involved. Future research could be conducted using qualitative methods, and a larger sample group also surveyed making use of mixed methods, to investigate the levels of internal corporate responsiveness to strategies for the external environments of companies, and whether their GSCM strategies assist them in gaining sustainable competitive advantage.

8. Conclusions

GSCM application in the manufacturing industry is both highly significant and relevant for enhancing the competitiveness and sustainability of all businesses globally.

The focus of this paper is to analyse how GSCM implementation can assist organisations in gaining competitive advantage over rival organisations in the FMCG manufacturing industry. The results indicate that most of the variables tested are significant, and attest to the notion that GSCM will enhance organisational performance and competitive advantage. The findings furthermore reveal the need for organisations to implement or introduce more environmentally friendly production processes, operations and product consumption, and how to approach their response to increased environmental concerns from various stakeholders, especially their consumers.

Also discussed in the study is the question of how organisations should handle sustainability issues, by looking beyond strategies designed simply to protect their image and showing consideration for the environment unsupported by action. Trust should therefore be developed in consumers through proper dissemination of information regarding standard certifications for the environmental impact of products.

Finally, it is observed that for the implementation of a GSC within an organisation to be successful, there must be effective collaboration between the various stakeholders, and compliance with environmental rules and regulations, since these practices will create an image of trustworthiness in consumers' minds.

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