



ENABLERS AND DE-ENABLERS OF GREEN SUPPLY CHAIN MANAGEMENT IN CAMEROON (THE CASE OF SOSUCAM)

Georgy Sone Mukete Munongo

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P.O. BOX 133, BUEA, CAMEROON**



DEPARTMENT OF BUSINESS AND MANAGEMENT STUDIES

**THE ENABLERS AND DE-ENABLERS OF GREEN SUPPLY
CHAIN MANAGEMENT IN CAMEROON**

(THE CASE OF SOSUCAM)

Defended on the 13 November 2019

A Thesis submitted to the Department of Business and Management Studies of the Pan African Institute of Development -West Africa (PAID-WA) Buea, in Partial Fulfilment of the Requirements for the Award of a Masters of Business Administration (MBA) with Specialization in Supply Chain Management.

By

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DECLARATION

I, MUNONGO GEORGY SONE MUKETE declare that this thesis is my original work and has not been presented for the award of a degree in any University and that, all the sources of materials used for the thesis have been duly acknowledged.

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CERTIFICATION

This is to certify that this thesis entitled: “The Enablers and De-enablers of Green Supply Chain Management in Cameroon (The Case of Sosucam)” is submitted to the Department of Business and Management Studies of the Pan African Institute for Development – West Africa (PAID-WA) Buea, by Munongo Georgy Sone Mukete Registration No. **PAIDWA01034** for the award of a Masters of Business Administration (MBA) with Specialization in Supply Chain Management.

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HOD Business and Management studies

DEDICATION

This work is dedicated firstly to God, to my parents, my siblings and to the entire body of science.

ACKNOWLEDGEMENT

I want to appreciate all those who in one way or the other contributed in the successful completion of this thesis.

I begin by thanking God for the life, wisdom, strength, sound health, opportunity and grace He granted me to complete this research.

I wish to express my heartfelt gratitude to my supervisor Dr. Njankwa Njabon Eric for his corrections, advise, guidance, and time he sacrificed to assist me in this research. The same goes to the co-supervisor Madam Gladys Asaah for her corrections and advice.

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I remain thankful to my parents for their moral, financial, material and spiritual support towards the successful completion of this research.

ABSTRACT

This research titled “the enablers and de-enablers of GSCM in Cameroon; case of SOSUCAM” is geared towards identifying and analysing factors contributing to, and those obstructing the implementation of GSC in SOSUCAM. This research was centred on the sustainable development and green economy theory. The model constructed for this study was inspired by other studies mentioned in our literature review which has undergone academic scrutiny, and has been approved. This research is exploratory, and made use of both primary and secondary data obtained through the internet, libraries, archival search, interviews with the management or staff of SOSUCAM and other partners of the enterprise, and questionnaires administered to customers. Qualitative data obtained through archival search and interviews constitutes the major part of our data collection, while the questionnaires constitute a minor part of our work. We used both random and stratified sampling method for the collection of data from both consumers and managers of SOSUCAM. Data was analyzed through personal judgment, and was equally carried out using the Statistical Package for the Social Science (SPSS). Results of the quantitative data were graphically represented using tables and graphs. The Pearson’s Chi-square test for independence was conducted to determine whether the various elements from the data collected depends on each other. We found that; Technology, Organizational strategy, Company Size, Financial resource, internal stake holders, Legal and Institutional Framework and Shareholders favors the implementation and evolution of GSCM in SOSUCAM. On the other hand; Interdepartmental communication, External Communication, Suppliers, Competitors and Consumers doesn’t favor the implementation and evolution of GSCM in SOSUCAM. We concluded that although SOSUCAM already engaged in implementing environmentally sustainable measures in its SC which benefits the enterprise, its workers and the general environment, more still needs to be done. We recommend that the state should provide incentives such as feed-in tariffs to encourage more enterprises to adopt environmental viable methods.

Key words: Green Supply Chain, Sustainable development, Corporate Social responsibility, Cameroon, Sugar.

TABLE OF CONTENT

DECLARATION.....	I
CERTIFICATION.....	II
DEDICATION.....	III
ACKNOWLEDGEMENT.....	IV
ABSTRACT.....	V
LIST OF TABLES.....	IX
LIST OF FIGURES.....	X
LIST OF APPENDICES.....	XI
LIST OF ABBREVIATIONS AND ACRONYMS.....	XII
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1 BACKGROUND OF THE STUDY.....	1
1.2 STATEMENT OF THE PROBLEM.....	9
1.3 RESEARCH QUESTION.....	10
1.4 OBJECTIVE OF THE STUDY.....	11
1.5 SIGNIFICANCE OF THE STUDY.....	11
1.6 ORGANIZATION OF THE STUDY.....	12
1.7 DEFINITION OF KEY TERMS.....	13
1.7.1 Enablers.....	13
1.7.2 De-enablers.....	13
1.7.3 Supply Chain.....	13
1.7.4 Green Supply Chain.....	14
1.7.5 Supply Chain Management.....	14
1.7.6 Green Supply Chain Management.....	15
CHAPTER TWO.....	17
LITERATURE REVIEW AND THEORETICAL FRAMEWORK.....	17
2.1 LITERATURE REVIEW.....	17
2.1.1 The Conventional Supply Chain.....	21
2.1.2 Green Supply Chain Management.....	22
2.1.3 Green Supply Chain Management Practices.....	24
2.1.4 Enablers and De-enablers of Green Supply Chain Implementation.....	29
2.1.5 The Supply Chain of Sugar.....	31
2.1.6 Advantages of Implementing Green Practices.....	34

2.2	THEORETICAL FRAMEWORK.....	36
2.2.1	Sustainable Development Theory.....	36
2.2.2	Green Economy Theory.....	40
2.2.3	Stakeholder Theory.....	41
2.2.4	Gaps Identified	41
CHAPTER THREE		42
METHODOLOGY OF THE STUDY.....		42
3.1	MODEL SPECIFICATION	42
3.2	DESCRIPTION OF VARIABLES IN THE MODEL.....	44
3.3	STUDY DESIGN.....	47
3.4	ANALYTICAL APPROACH.....	49
3.5	VALIDATION OF THE RESULT	49
CHAPTER FOUR.....		50
DATA ANALYSIS AND PRESENTATION OF RESULTS.....		50
4.1	DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS	50
4.1.1	GENDER OF RESPONDENTS	51
4.1.2	AGE GROUP OF RESPONDENTS	53
4.2	RESULTS OF THE FINDING	55
4.2.1	What are the factors promoting or obstructing the development of GSCM in SOSUCAM?	55
4.2.2	How is GSCM implemented in SOSUCAM?	92
4.2.3	How beneficial is the Greening of the Sugarcane Sugar value chain by SOSUCAM? 102	
4.2.4	How are the economic and environmental dimensions of GSC managed synchronously in SOSUCAM?.....	106
4.3	THE IMPLICATION OF THE FINDINGS	108
4.4	LIMITATION OF THE STUDY	108
4.4.1	Scope of the Study.....	108
4.4.2	Time Frame.....	109
4.4.3	Geographical Delimitation	109
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS		110
5.1	SUMMARY OF FINDINGS	110
5.1.1	Analyze the factors contributing to promoting and obstructing the development of GSCM of Sugar in Cameroon	110
5.1.2	The implementation of GSCM practices in SOSUCAM.....	112
5.1.3	The benefits of greening the value chain of sugarcane Sugar by SOSUCAM.....	114

5.1.4 Analyze how the economic and environmental dimensions of GSC are synchronously managed in SOSUCAM	116
5.2 CONCLUSION	117
5.3 RECOMMENDATION	117
5.3.1 To SOSUCAM	118
5.3.2 To the Government	118
5.3.3 To consumers.....	118
5.3.4 Competitors	119
5.4 SUGGESTED AREAS FOR FURTHER RESEARCH.....	119
REFERENCES.....	120
APPENDIX A.....	133
APPENDIX B	136
APPENDIX C	138

LIST OF TABLES

TABLE 1: TOP FIVE ITEMS GLOBALLY PRODUCED IN 2000 AND 2013	2
TABLE 2: DIFFERENCES BETWEEN SCM AND GSCM.....	22
TABLE 3: INTERNAL FACTORS INFLUENCING GSC IMPLEMENTATION	30
TABLE 4: EXTERNAL FACTORS INFLUENCING GSC IMPLEMENTATION	31
TABLE 5: PERCENTAGE OF RESPONDENT PER REGION.....	50
TABLE 6: SATISFIED WITH SOSUCAM-CUSTOMER COMMUNICATION * GENDER.....	78
TABLE 7: GENDER * SUGAR PRICE PERCEPTION	80
TABLE 8: GENDER * ENVIRONMENTAL CONSCIOUSNESS	81
TABLE 9: GENDER * HEALTH CRITERIA	82
TABLE 10: REGION OF RESIDENCE * HEALTH CRITERIA	83
TABLE 11: REGION OF RESIDENCE * ENVIRONMENTAL CONSCIOUSNESS	84
TABLE 12: REGION OF RESIDENCE * SUGAR PRICE PERCEPTION.....	85
TABLE 13: REGION OF RESIDENCE * SATISFIED WITH SOSUCAM-CUSTOMER COMMUNICATION	86
TABLE 14: AGE GROUP * SATISFIED WITH SOSUCAM-CUSTOMER COMMUNICATION.....	87
TABLE 15: AGE GROUP * SUGAR PRICE PERCEPTION	88
TABLE 16: AGE GROUP * ENVIRONMENTAL CONSCIOUSNESS	89
TABLE 17: AGE GROUP * HEALTH CRITERIA	90
TABLE 18: FACTORS CONTRIBUTING TO PROMOTING AND OBSTRUCTING THE DEVELOPMENT OF GSCM IN SOSUCAM.....	110

LIST OF FIGURES

FIGURE 1 : SOSUCAM'S COMPETITORS IN THE CAMEROONIAN CANE SUGAR MARKET	4
FIGURE 2: CAMEROON'S 2008-2017 CENTRIFUGAL SUGAR DATA	5
FIGURE 3: SOSUCAM'S VARIETY OF SUGAR AND PACKAGING	7
FIGURE 4: SOSUCAM'S WAREHOUSE.....	7
FIGURE 5: THE FLOW OF GSCM.....	24
FIGURE 6: THE SC OF CANE SUGAR.....	32
FIGURE 7: THE THREE PILLARS OF SUSTAINABILITY	38
FIGURE 8: PAID'S SIX PILLARS OF SUSTAINABLE DEVELOPMENT	39
FIGURE 9: ENABLERS AND DE-ENABLERS OF GSCM IN SOSUCAM.....	43
FIGURE 10: STUDY DESIGN	48
FIGURE 11: GENDER OF RESPONDENTS	51
FIGURE 12: GENDER OF SAMPLED CONSUMERS PER REGION.....	52
FIGURE 13: AGE GROUP OF RESPONDENTS	53
FIGURE 14: AGE-GROUP OF RESPONDENTS PER REGION	54
FIGURE 15: LEVEL OF ENVIRONMENTAL CAUTIOUSNESS OF CONSUMERS.....	58
FIGURE 16: CUSTOMERS' AWARENESS OF SOSUCAM'S ENVIRONMENTAL STRATEGIES	59
FIGURE 17: CONSUMPTION RATE OF VARIOUS SUGAR BRANDS.....	60
FIGURE 18: CUSTOMERS' SUGAR BRAND SELECTION CRITERIA.....	61
FIGURE 19: CUSTOMER'S PERCEPTION ON SUGAR PRICE	61
FIGURE 20: CUSTOMERS' SATISFACTION LEVEL ON SOSUCAM-CUSTOMERS COMMUNICATION ..	62
FIGURE 21: CUSTOMERS' AWARENESS ON SOSUCAM'S ENVIRONMENTAL STRATEGIES	63
FIGURE 22: CUNSUMPTION RATE OF IDENTIFIED SUGAR BRANDS	63
FIGURE 23: CUSTOMERS' CONSIDERATION OF THE ENVIRONMENTAL IMAGE OF COMPANY	64
FIGURE 24: CUSTOMERS AWARENESS OF COMPETITORS' ENVIRONMENTAL STRATEGIES.....	65
FIGURE 25: CUSTOMERS' AWARENESS OF SOSUCAM'S ENVIRONMENTAL STRATEGIES	65
FIGURE 26: CUSTOMERS' SUGAR BRAND SELECTION CRITERIA	66
FIGURE 27: CUSTOMERS'S CONSIDERATION ON THIER HEALTH WHILE SELECTING SUGAR TO PURCHASE.....	68
FIGURE 28: SOSUCAM'S IRRIGATION PROJECT.....	77
FIGURE 29: DASANI AND ODWALLA 100% RECYCLABLE PLANT BOTTLE.....	97
FIGURE 30: TETRA PAK'S 100% PLANT BASED PACKAGE AND SUGARCANE BOTTLE CAP.....	98
FIGURE 31 INFORMATION ON ZULKA MORENA PURE CANESUGAR PACKAGE	100
FIGURE 32: THE IMPLEMENTATION OF GSCM PRACTICES IN THE SUGAR INDUSTRY IN CAMEROON	113
FIGURE 33: THE BENEFITS OF GREENING THE VALUE CHAIN OF SUGARCANE SUGAR	115
FIGURE 34: THE TWO DIMENSIONS OF GSCM IN SOSUCAM.....	116

LIST OF APPENDICES

PICTURE 1: SOSUCAM'S SUGAR SOLD IN THE MARKET	138
PICTURE 2 : TYPES OF SUGAR PRODUCED BY SOSUCAM.....	138
PICTURE 3: CONSUMABLES CONTAINING SUGAR.....	138
PICTURE 4: TYPES OF SUGARCANE CULTIVATED BY SOSUCAM.....	138
PICTURE 5: SUGARCANE MOLASSES/ TREACLE.....	138
PICTURE 6: SUGARCANE BAGASSE / FIBER	138
PICTURE 7: BIO-BASED POLYETHYLENE PRODUCTS MANUFACTURED FROM SUGARCANE	138
PICTURE 8: THE RESEARCHER AND THE COMMUNICATION OFFICER OF SOSUCAM.....	138
PICTURE 9: THE RESEARCHER AND THE PRODUCTION OFFICER OF SOSUCAM.....	138
PICTURE 10: BRAZILIAN SUGARCANE - ETHANOL FUEL STATION.....	138

LIST OF ABBREVIATIONS AND ACRONYMS

3Rs	Reduction, Reuse and Recycling of materials in the process of purchasing
4R1D	Reduce, Reuse, Reclaim, Recycle and Degradable
ANAFOR	Agence nationale d'appui au développement forestier
ANOR	Agence des Normes et de la Qualité
ANRP	Agence nationale de radioprotection
CAMSUCO	Cameroon Sugar Company
CDC	Cameroon Development Corporation
CHOCOCAM	Chocolaterie Confiserie Camerounaise
CHR	Cafés, Hotels & Restaurants
Co ₂	Carbon Dioxide
DTMA	Direction Technique du Machinisme Agricole
EMAS	Eco-Management and Audit Scheme
EMS	Environmental Management System
FSC	Forest Stewardship Council
FCFA	Franc, Communauté Financière d'Afrique
GPS	Geographical Positioning System
GSCM	Green Supply Chain Management
HDPE	High-Density Polyethylene
IBM	International Business Machines
ISO	International Standards Organization
MINEPDED	Ministry of Environment, Nature protection and Sustainable Development
MINFI	Ministry of Finances
MINMIDT	Ministry of Mines, Industries and Technological Development
NC	Non-Conformance
NGO	Non-Governmental Organization
NOSUCA	Nouvelles Sucreries du Cameroun
OHSAS	Occupational Health and Safety Assessment Specification
ONACC	Observatoire national des changements climatiques
PET	Polythene Terephthalate / Polyethylene Terephthalate

QSED	La Direction Qualité Environnement Sécurité et Développement
SABC	Société Anonyme des Brasseries du Cameroun
SC	Supply Chain
SCM	Supply Chain Management
SOMDIAA	Société d'Organisation de Management et de Développement des Industries Alimentaires et Agricoles
SOSUCAM	Société Sucrière du Cameroun
SPSS	Statistical Package for the Social Science
SUMOCAM	Sucreries Moderne du Cameroun
UN	United Nations
USA	United States of America
USAID	United State Agency for International Development
WCED	World Commission on Environment and Development

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The concept of Green Supply Chain Management (GSCM) emerged from both supply chain management (SCM) and Environmental Management (Srivastava, 2007), to tackle the influences and relationship between supply chain and the environment (Bhattacharjee, 2015). The fast-growing global economy has brought not only about welfare, but also environmental degradation, such as climate change, ozone layer depletion, loss of biodiversity, pollution and degradation of air, water, minerals and land. These issues have caught the attention of firms due to rising pressure from their stakeholders (such as regulatory bodies, consumers, competitors, NGOs and employees) requiring them to address environmental and social sustainability in their business operations (Laar, 2016).

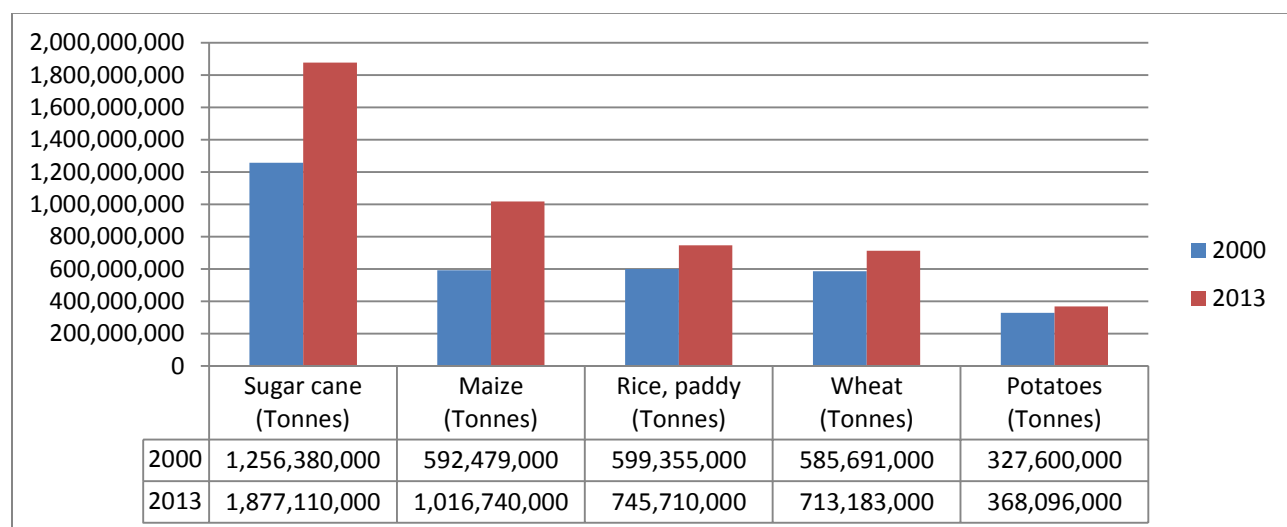
In the past, operating managers had a limited role to play as far as environmental management was concerned. On the other hand, separate organizational units were responsible for ensuring ecological consideration in; process design, product development, operations, marketing, logistics, regulatory compliance and waste management (Srivastava, 2007). As competition intensified in the 1990s, the increased awareness of green practices instilled a sense of CSR within the supply chain (SC) of firms. As such, at the beginning of 1995, GSCM began attracting considerable scholarly interest and had been increasing till date (Chin et al., 2015). Green supply chain substantially influences the total environmental impact of firms or organizations. It aims at mitigating or eradicating waste of all nature and the emission of harmful substances along the SC (Chin et al., 2015).

GSCM has become an essential organizational tool in the modern business environment to gain a competitive advantage (Lin & Sheu, 2012). The implementation of GSCM begins from Green Designing (Recycling Design, Unloading Design, Model Design), Green Production (Green Techniques, Green Suppliers, Green Material), Green Packaging (Green Environment, Green Ideas, Recycling Package Material), Green Marketing (Green information, Green Product, Green

Selling), Green Recycling (Recovery Processing, Recycling, Waste Disposal), or the end-of-life management of the goods after its useful life (Meythi & Martusa, 2013) (Seman, et al., 2012). The greening process of a Supply Chain consists of various actors whose activities contribute either directly or indirectly in the manufacturing and timely delivery of goods and services to the final consumer. GSCM can be summarized as "Green Purchasing + Green Manufacturing/Materials Management + Green Distribution/Marketing + Reverse Logistics" (Meythi & Martusa, 2013).

Working towards attaining emergence by 2035, Cameroon has been and is still experiencing an increase in business activities which has not left the environment untouched. These activities have contributed to environmental degradation, therefore making it necessary for all businesses to incorporate ecological thinking at all levels of its business operations. This greening process will enable the company to achieve sustainable development. For Development to be durable, the three (3) dimensions of sustainable development (Social, Economic and Environmental) must be considered. It is not possible to achieve sustainable development without environmental concerns. Cameroon has a multiplicity of agricultural products which are either consumed directly or used as input by some factories in the production of aliments. Some of these agricultural products include; bananas, mangoes, pineapples, plantains, potatoes, sugarcanes, etc. giving Cameroon a massive potential for developing its GSC. This study aims at presenting the enablers and de-enablers of GSCM (The case of The Sugar Industry) in Cameroon.

Table 1: Top five items globally produced in 2000 and 2013



Sugar is one of the products with a continually rising demand across the globe (USDA, 2017). The FAO (2015) classified sugarcane; which is the raw material used in sugar production as the most produced agro product across the globe in the year 2000 and 2013, with a total production of 1,256,380,000 tons in the year 2000 and 1,877,110,000 tons in the year 2013. Sugar is either used as a finished product (for direct consumption) or as a raw material or input (for further production) by some enterprises in the agro-alimentary industry or the food industry for production. This increase in the global demand and consumption rate of sugar has led to a rise in its production across the globe (USDA, 2017).

Cameroon, also known as “*Africa in miniature*” due to; its diversity in climate, culture, soils, geography, etc. (Cameroon, 2001, November 30), makes it possible for the growth and development of a multiplicity of activities and resources among which are agro-products. Some of these agro-products include; cocoa, banana, rubber, oil palm, rice, tea, coffee, sugarcane, and many more which are either consumed directly or used as input by other factories.

Cameroon's sugar processing industry forms a small portion of Cameroon's food processing industry. SOMDIAA (Société d'Organisation de Management et de Développement des Industries Alimentaires et Agricoles) a French conglomerate, dominates the Cameroon sugar industry via SOSUCAM (Société Sucrière du Cameroun). SOMDIAA established SOSUCAM in 1965 at the Mbandjock site, while CAMSUCO (Cameroon Sugar Company) was established in 1975 in Nkoteng by the state and was later privatized and sold to SOSUCAM in 1998 (The Coca-Cola Company, 2017)(White et al., 2015).

Sugar has a broad market in Cameroon such as homes, schools, offices, hotels, bakeries, restaurants, other manufacturing companies, etc. Sugar serves as an input in various industries such as in the brewery industry, agro-alimentary industry (for example, bakeries, biscuits, glossaries, etc.). Société anonyme des Brasseries du Cameroun (SABC); a local subsidiary of the Castel group, purchases 20% of SOSUCAM's output (30,000 tons of granulated sugar) annually from SOSUCAM (Business in Cameroon, February 2018).

The consumption rate of sugar in Cameroon has been on the increase as the demand for sugar keeps rising year after year such that it exceeds local production. SOSUCAM being the leading supplier of sugar in Cameroon, produces about 130 000 tons of sugar every year, including 17 000 tons as lump sugar. It supplies a significant proportion of its output in the Cameroonian

sugar market (about 100 000 tons) and exports the extra-refined sugar to Chad where it's used in breweries (SOMDIAA, 2018 April 18). SOSUCAM realizes a turnover of about 60 Billion FCFA per year (Arsene, 2017). Due to demand exceeding supply, the Cameroon government routinely allows a tax and custom duty-free importation of sugar. This measure has been put in place to promote the inflow of sugar and complement SOSUCAM's production in the Cameroonian sugar market (Business in Cameroon, July/August 2013). As a result of this governmental action, SOSUCAM threatened to shut down its cane sugar production mill due to smuggling and unfair competition from imported sugar brands benefiting from special tax and customs exemptions (Jeune Afrique, 2018 April 5). SOSUCAM was calling on the government's intervention without which it would be forced to close down its sugar production.



Figure 1 : SOSUCAM's competitors in the Cameroonian cane sugar market
(Researcher, 2018)

Some of SOSUCAM’s competitors dealing in cane-sugar identified in the course of our research in the Cameroonian sugar market are; Dethom, SUMOCAM, Dadidou and Zulka as seen in figure 1 above. Although there are various substitutes to sugarcane sugar such as; honey, stevia sweetener, Belle France sweetener, sugar extracted from roots by IRAD, the focus of this study is on sugarcane-based sugar.

From the statistics shown in figure 2 below, a considerable increase can be noticed in the human domestic consumption of sugar between 2008 – 2013, and later begins to drop from 2014 – 2016, and rises again in 2017. In 2008 the local production added to the imported sugar exceeded household consumption by 36 000 metric tons. From 2009-2010, the quantity of sugar consumed exceeded the number jointly produced and imported by 7000 and 34000metric tons, these extra 41000 metric tons consumed were probably balanced with the additional stock from previous years. In 2011 and 2012 importation and production were equivalent to household consumption, while from 2013-2017 the household sugar consumption exceeded the sugar imported added to the quantity produced in each respective year.

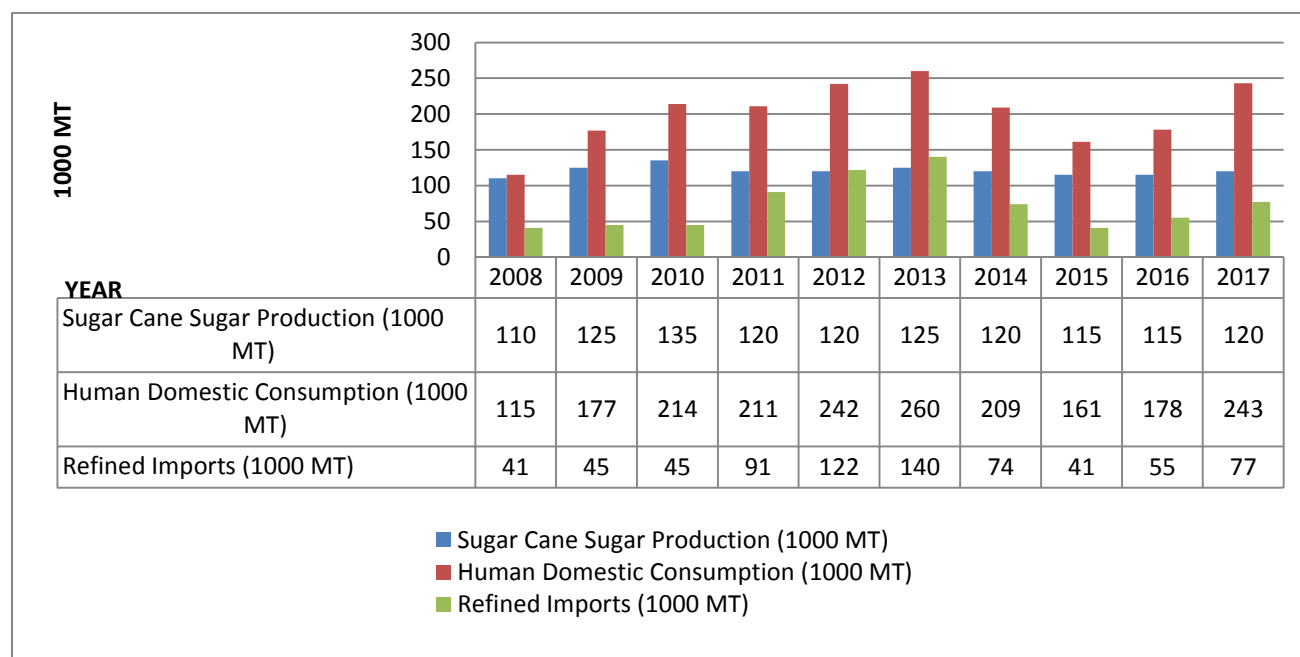


Figure 2: Cameroon's 2008-2017 Centrifugal Sugar Data

Source: indexmundi (2018)

The supply chain of sugar begins with the cultivation of sugarcane and ends with sugar in the hands of the final consumer. The sugar industry in Cameroon significantly contributes to reducing the unemployment rate by employing skilled and semi-skilled labourers at all levels of its SC. These includes; farmers (involved in the cultivation and harvesting processes of the sugar cane from the plantations), drivers (to transport the harvested sugar cane from the farm to the factory and to transport other procured inputs to the factory and outputs to the markets), logisticians, storekeepers, agronomists, topographers, managers, etc.

SOSUCAM was created in 1964 but launched its activities in 1965 in Mbandjock, located in the Upper-Sanaga, north of the Center region of Cameroon. There also is the former state-owned company created in 1975 in Nkoteng under the name CAMSUCO, which was later privatized and sold to SOSUCAM in 1998. Mbandjock and the Nkoteng site are now owned by the SOMDIAA Group, which holds 72.72% of its stock (White, 2015) (SOMDIAA, 2018).

The SOMDIAA Group is a large French holding company that specialized in agro-food processing across Central and West Africa and the Indian Ocean region. SOMDIAA Group is mainly involved in the production and marketing of sugar, flour, eggs, day-old chicks and animal feed. The company has its headquarters located in Paris, France, and all operational aspects (crop and poultry farming, processing, and marketing and sales) occur at source through its subsidiaries in Cameroon, the Congo, Ivory Coast, the Central Africa Republic, Gabon, Chad, Togo, and Reunion Island. The company supplies local agri-industry related manufacturers and processors in its geographical area of operation (Coca-Cola Company, 2017).

SOSUCAM, which is the leading supplier of sugar in Cameroon's sugar market, was established with a capital of CFA 13,925,000,000. The SOMDIAA Group holds 72.72% of its stock, the Cameroonian Government 15.02%, while its remaining capital is distributed among Cameroonian private shareholders including SOSUCAM employees. Sosucam grows 46,207 acres of sugarcane plantations located in Mbandjock and Nkoteng, in the Upper-Sanaga, 62 miles north of Yaoundé, and having its corporate headquarters located in Yaoundé. With 1.08 million tons of sugarcanes ground in both mills, SOSUCAM produces about 105,000 tons of sugar every year, including 17,000 tons as lump sugar. It sells about 100,000 tons on the Cameroonian market and supplies Chad with extra-refined sugar, which is used in breweries.

SOSUCAM produces brown and white sugar in both its granulated and lump state. After production, SOSUCAM commercializes its sugar through its three central warehouses located in Yaoundé, Douala, and Ngaoundere, under the brand name “Princesse Tatïe” with special packaging adapted to soothe the needs of Cameroonian consumers (Arsene, 2017). The varieties of sugar produced by SOSUCAM and sold in the Cameroonian sugar market can be seen in figure 3 below.



Figure 3: SOSUCAM's Variety of Sugar and Packaging

(Researcher, 2018)



Figure 4: SOSUCAM's Warehouse

(Researcher, 2018)

SOSUCAM has already obtained (3) three certifications which attest its compliance with the standard quality requirements:

ISO 9001, V2000: issued in 2008 by Bureau Veritas Certification France for its compliant quality management system, and it is renewed every year.

The Nkoteng mill received in 2015 the ISO 22000:2005 certification and both mills received FSSC 22000 under the demand of Coca Cola Company, and ISO 22000:2005 certifications in 2016 (Coca-Cola Company, 2017).

NC 11: issued in 2001 by the Cameroonian Government following the audit run by an independent company. It confirms SOSUCAM's ability to produce sugar following international standards.

Environmental compliance certificate: also issued by Government authorities following an audit. It shows SOSUCAM's commitment to operating while preserving natural resources and its concern towards protecting the living environment of employees and local populations.

SOSUCAM equally had as objective obtaining the ISO 14001 and OHSAS 18001 certifications by 2015, although this objective is not attained, it is still in process.

SOSUCAM's SC begins with the cultivation of Sugarcane and ends with the final product (Sugar in all its forms) in the hands of the ultimate consumer. Within SOSUCAM's supply chain we can find various activities such as;

The Cultivation of Sugarcane. SOSUCAM cultivates the sugarcane it uses for the production of sugar and does not rely on any external supplier. With the aim of enhancing agricultural yield and improve farming practices, SOSUCAM makes use of modern farming technologies. These technologies among many includes; GPS self-guidance for farming machines to help optimize farming machines movements, including during soil preparation.

Soil resistivity measures have made it possible to determine the accurate specifications of cultivated areas to apply soil dressing and fertilizer treatments on a need-only basis.

The Production of granulated sugar (golden and refined sugar), lump sugar and special sugar (wrapped sugar lumps and sugar sticks).

Distribution to clients such as; industrial customers, the wholesaler network and the CHR (Cafés, Hotels & Restaurants) segment, with some of its major clients being Nestle, SABC, CHOCOCAM, The Coca-Cola Company and others (SOMDIAA, 2018) (Arsene, 2017).

SOSUCAM is ranked the 3rd major employer in Cameroon after the state and CDC (Cameroon Development Corporation). It has over 8000 employees who constitute about staffs, 355 skilled labourers, and 7544 unskilled labourers (Arsene, 2017). Among its 8000, and more employees, about 1,500 are permanent employees while about 7,000 are seasonal employees, especially during promotion periods (Media Terre, 2018).

SOSUCAM also provides CSR to the community within where it operates in various ways which include;

The establishment of Telemedicine services to offer special healthcare services to company employees and neighbouring populations at lower costs. SOSUCAM has also made available cardiology consultations and tests from the SOSUCAM social and medical centres. The SOMDIAA selected the Nkoteng site in Cameroon to launch its pilot project in partnership with GENESIS TELECARE; a Cameroonian company specialized in that area. The Nkoteng Telemedicine Center opened on February 18th, 2010.

SOSUCAM also assist the local population in transportation by providing bus shuttle services. The shuttles are such that both the workers and the local community whose destination is around or on the way to the SOSUCAM site are transported to-and-fro, free of charges.

SOSUCAM proceeded with the creation of a college, and two nursery and primary schools to enable the local population to gain access to education.

1.2 Statement of the Problem

In almost every part of the globe such as; USA, Europe, Japan and even Africa, environmental concern is gaining grounds, especially in developed nations. This has caused most companies to see the need for greening its activities to reduce environmental issues, which is one of the predominant challenges faced by the globe. Also, environmental problems have a multiplier effect on various sectors of activities and humanity in the short as well as long run.

According to "The World Factbook", Cameroon's current environmental issues include; waterborne diseases, deforestation, overgrazing, desertification, poaching and overfishing (CIA, 2019). All of these issues are as a result of man's actions, placing little or no consideration on the direct and indirect impact their actions have or could have on the environment. There is a poor or no remanufacturing or recycling system in Cameroon, as a result of the lack of proper end-of-life management plan of a product after its useful life. Due to the absence of an appropriate end-of-life management plan of products, they end up being burnt, leading to the release of toxic substances in the atmosphere, which is detrimental to the environment. Meanwhile, in other parts of the world such as in Kenya, Jemutai, (2014) states that automotive firms implement green procurement, where they ensure that their suppliers satisfy their environmental criteria, purchase environmentally friendly materials, purchasing energy-saving equipment. As for the implementation of green manufacturing, they make use of a highly effective and efficient machine that consumes less power. They also implement reverse logistics, where they engage in the collection of products and package from the environment after its useful life for; reuse, recycling, and remanufacturing. Coca-Cola also came up with a 100% bio or plant-based (Coca-Cola Company, 2015, June 3). It is therefore essential for organizations, factories and industries in Cameroon to equally join this move towards the green initiative, thus contributing to the achievement of sustainable development goals.

This research is therefore geared towards identifying and analyzing elements and factors contributing to, and those obstructing the establishment and development of GSC in the Cameroon sugar industry, and equally to analyze its overall impact in ascertaining a sustainable development in Cameroon.

1.3 Research Question

The main research question is;

- What are the factors promoting or obstructing the development of GSCM in SOSUCAM?

The specific research questions are;

- How is GSCM implemented in SOSUCAM?
- How beneficial is the Greening of the Sugarcane Sugar value chain by SOSUCAM?

- How are the economic and environmental dimensions of GSC managed synchronously in SOSUCAM?

1.4 Objective of the study

The main objective of this study is to;

Analyze factors contributing to promoting and obstructing the development of GSCM in SOSUCAM.

The specific objectives of this study are to;

- Assess how GSCM practices are implemented in SOSUCAM.
- Examine the benefits of Greening the value chain of sugarcane Sugar by SOSUCAM.
- Analyze how the economic and environmental dimensions of GSC are synchronously managed in SOSUCAM.

1.5 Significance of the study

SCM is a recent concept still gaining grounds in Cameroon, and GSC is a new aspect of SC with little written on it as far as Cameroon is concerned. This research will, therefore, contribute to other existing literature on GSCM in the world and Cameroon especially. This research will be of help to academicians for future research related to GSC.

The findings from this research will be relevant to Administrative units and policymakers in Cameroon, assisting them design policies that favors the implementation of GSCM so as to ascertain sustainable development and a better livelihood, such as; the urban and rural councils, ministry of transport, ministry of scientific research and innovation, ministry of small and medium sized enterprises, ministry of industry, mines and technology, ministry of environment and nature protection in Cameroon, and others.

The findings from this research will enable Sosucam's customers to benefit from healthy and environmentally sound products, thereby reducing waste deposits and pollutant in the environment within which they live and interact.

This study is also significant to the immediate environment of Sosucam such as the workers and local community, who stands to gain from the environmentally friendly measures, adopted by the latter to reduced pollution rate and improve livelihood.

Through this research, other industries and factories, including other potential investors in the sugar industry, can realize the importance of Greening their SC, and how it can be done, thereby contributing to sustainable development.

This study will enable SOSUCAM to improve on its efficiency, reduce or eliminate waste along its SC, expand its scope, and realize how it can implement Green practices along its Sugar production SCM.

This research will also enable the researcher to acquire more knowledge and experience on social science research methodology, and the applicability of environmental-friendly measures on the SC of Sugar in Cameroon, and defend his thesis.

1.6 Organization of the study

This research is structured into five chapters.

Chapter one tackles the general Introduction which consist of; the background of the study, the background of the company case study, statement of the problem, objective of the study, research questions, significance of the study, organization of the study, definition of keywords.

Chapter two handles the literature review related to the SC of sugar, the GSC of sugar, and sustainable development, and demonstrates the limitations of other existing literature and how this work will fill the gap.

Chapter three deals with the method and methodology used in the study; model specification, description of variables, study design, mode of data collection, method of analysis.

Chapter four provides an analysis of collected data and discussion on findings. This chapter also clearly shows the limitation of the study.

Chapter five gives a summary of the finding, conclusion, limitations of the research and recommendations.

1.7 Definition of Key Terms

1.7.1 Enablers

According to Merriam-Webster's Collegiate Dictionary (1993, p. 408), a facilitator is one that enables another to achieve an end.

The Cambridge advanced learner's dictionary (2013) defines an enabler as something or someone that makes it possible for a particular thing to happen or be done.

The Business dictionary (2018) states that enablers are capabilities, forces and resources that contribute to the success of an entity, program or project.

Although all the above definitions of enablers are appealing, we will be making use of the definitions by the Business dictionary and Cambridge dictionary, which are more explicit for our research. The definition by the Merriam Webster's collegiate dictionary is vague, while the business dictionary limits enablers to "something". On the other hand, the Cambridge dictionary specifies enablers being an "entity" or "something". We will, therefore, refer to an enabler as an entity or something that contributes to the achievement or success of a program or project. We will be using enablers in the context of GSC as all actors and elements which renders possible and facilitates the implementation and development of GSC.

1.7.2 De-enablers

Having defined "enablers" above, and knowing that "de-enablers" is the opposite of enablers, we can therefore by induction, define "de-enablers" as an entity or something that hinders the achievement or success of a program or project. We will be referring enablers in the context of GSC as all actors and elements which hinders or obstruct the implementation and development of GSC.

1.7.3 Supply Chain

According to Christopher (1998), SC refers to the organization's network involved in the various processes and activities that generate value in the form of goods and services in the hands of the final consumer.

Beamon (1998), states that a Supply Chain is "a structured manufacturing process wherein raw materials are transformed into finished goods, then delivered to end customers".

According to Chow, and Heaver, (1999), SC is "the group of manufacturers, suppliers, distributors, retailers and transportation, information and other logistics management service providers that are engaged in providing goods to consumers".

SC is a life cycle processes comprising physical, information, financial, and knowledge flows with the purpose of satisfying end-user requirements with products and services from multiple linked suppliers (Ayers, 2001).

There are some vital elements of SC which should not be left out of the definition of SC to avoid polemics or controversies. Some of these essential elements are; the network or relationship, quality, cost, and time factor, not leaving out the various flows such as the physical, information and financial flow. In our context, SC, therefore, entails a network or interconnection of all activities associated with the timely flow and transformation of goods from the supplier as raw material through the end-user in its finished state and desired quantity and quality as well as the associated information and financial flow.

1.7.4 Green Supply Chain

GSC is made up of two terms, namely “Green” and “SC”. Having defined of SC, the word “green” according to the Business dictionary (2018) is having positive environmental attributes or objectives. In other words, it means environmentally friendly. Therefore in our research, incorporating a “Green” component in SC leads us to an environmental-friendly SC.

1.7.5 Supply Chain Management

Hau and Billington (1995) defines SCM as the interconnections of activities taking place among facilities network that acquires raw material, transform them into intermediate products and then final goods, and deliver goods to clients through a system of distribution.

Computerworld (2001) defines SCM as the management that allows an organization to get the right products and services to the location they required on time, in a suitable quantity and at a satisfactory cost.

SCM has been defined by Chopra & Meindl, (2001) as the management of material, money, men, and information within and across the SC to maximize customer satisfaction and to gain competitive advantage.

According to Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. (2003), SCM refers to a set of methods used to effectively coordinate suppliers, producers, depots, and stores, so that commodity is produced and distributed at the correct quantities, to the right locations, and at the exact time, in order to reduce system costs while satisfying service level requirements.

The definition by Hau & Billington (1995) fails to highlight the efficiency and effectiveness of the SCM process. Customers demand a certain quantity of products with expected quality, at the right place, at the right time, and at the lowest possible cost. For this demand to be satisfied, an excellent collaboration should be established with all the actors along the SC. SCM, therefore, coordinates that collaboration for its effectiveness and efficiency, to provide satisfaction to both consumers and the business. In this study we will define SCM as the planning, implementation, monitoring and controlling of all interconnected activities associated with the timely flow and transformation of goods from the supplier as raw material through the end-user in its finished state and desired quantity and quality as well as the associated information and financial flow so as to maximize consumer satisfaction and gain competitive advantage.

1.7.6 Green Supply Chain Management

Hervani et al., (2005) defines GSCM using the equation; Green Purchasing/Procurement + Green Manufacturing/Materials Management + Green Distribution/Marketing + Reverse Logistics.

Green Supply Chain entails the integration of environmental thinking into SCM, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers, and end-of-life management of the product after its useful life. (Srivastava, 2007).

Wang & Luo, (2010) states that GSCM is a SC guided by the sustainable development theories. Kerstin & Joanne, (2016) describes GSCM as SCM with an environmentally friendly or green component incorporated into every aspect of the SC. It covers a product's whole life cycle from sourcing, design, product development, manufacturing, packaging, storage and transportation to disposal, recovery and post-sales services including end-of-product life management.

The definition by Hervani et al. (2005) focuses on the GSCM practices, while the definition by Wang & Luo (2010) extends the scope of GSCM from being economical and environmental to incorporate the Social aspect, which are the dimensions or aspects of sustainable development. The definitions by Srivastava, (2007) and Kerstin & Joanne, (2016) expounds more on the meaning of GSCM, and are more explicit and understandable. We are going to make use of the definition by Kerstin & Joanne, (2016) in our research.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature Review

After studying the implementation of GSCM within the pulp and paper industry to identify measures taken to improve environmental sustainability and what is left out, Anker-Rasch & Sørsgard, (2011) discovered that the pulp industry is increasingly focusing on how to become sustainable especially in Europe and North-America. But the focus of the majority of these companies lies on reducing emissions within the company, while less attention is paid to green design, which can nevertheless lead to significant improvement. Companies equally don't engage in measures to reduce emissions from transportation, which contributes significantly to the increasing greenhouse gas emissions. Kumar et al. (2012) carried out a comparative study on GSCM implementation in the sugar, electronic and automobile industries, and found out that the sugar industry is basically a “green” industry, meanwhile other industries such as the automobiles and electronics industry needs to follow numerous steps so as to render its SC activities environmentally sustainable beginning from raw material acquisition where they will have to see to it that their suppliers respect similar environmental norms. The sugar industry has the capacity to produce its energy from bagasse which is crushed sugarcane fibre obtained after the extraction of juice, while the energy used in the automobiles and electronics industry is derived from electrical grids running on coal which is unsustainable. The byproducts obtained during the production of electronic and automobile goods are toxic, and thus needs to be handled and disposed of carefully which leads to extra cost, while the by-products obtained from sugar industry are used as raw materials in other industries like paper, spirits etc. Bagasse earned from the sugar industry can be used as an alternative for wood in the production of paper, which reduces the dependence on wood for making paper, therefore, contributing in making the paper industry green. They equally found that for a consumer to use an automobile and electronic equipment they will need electricity and petroleum-based products as an energy source which are derived from fossil fuels which are unsustainable to the environment, while sugar needs no input, it instead serves as an input to other aliments. Automobiles and electronic items are disposed of improperly after use, while sugar is an alimentary product which is consumed entirely.

Ojo, et al. (2014) focused their findings on Green Supply Chain Management implementation in developing countries which revealed that Green Supply Chain Management is gaining grounds in developing countries such as; Singapore, India, China, Hong Kong, and Malaysia. In South Africa, it is mostly implemented in manufacturing firms and a few construction firms. Their findings also revealed that GSCM is not new to the transport and food industry in South Africa, but the practice is still being introduced to South Africa's construction firms which make a sensitization campaign in the construction industry a necessity.

Wang & Luo, (2010) established five significant constituents of GSCM, which are; green design process, green procurement, green production, green marketing, green transport, and recycling. They realized that the traditional SCM of the car industry in China is facing environmental and resource pressures, which implements GSCM a necessity as it contributes to SD.

Kamolkitiwong & Phruksaphanrat, (2015) proceeded with the ranking of drivers to GSCM implementation in their order of importance, and established the pressure from regulatory organs as the predominant driver/factor influencing the implementation of GSCM or in other words, the development of environmental strategies in the electronics industry in Thailand, followed by influence from top management, and next by pressure from consumers/market demand, and there also is Organization strategy which is also essential in the development of environmental policies. Economic benefit, influence from competitors, cost minimization, stakeholder influence, reverse logistics and supplier were considered as having a lesser impact on the implementation of GSCM in the electronics industry in Thailand. Various companies and organizations adopt GSCM due to the benefits associated with the adoption of GSCM. According to Kumar & Putnam, (2008), global factors such as; market competition, regulations and globalizing growth has an impact on all businesses. Some industrial sectors such as the automotive, consumer appliances and electronics industries have successfully implemented the end-of-life management of products and equally established economically efficient recovery, reuse and recycling systems, which has changed the views on sustainable design, manufacturing and waste management. They also realized that remanufacturing is an appealing model, but will not be applicable in all industrial sectors. For remanufacturing to be globally accepted, there will have to be an increase in economic factors and regulatory pressures where consumer values will have to change so that they recognize the importance of remanufactured goods. Hajikhani et al. (2012) found that GSCM is a strategic modern innovative managerial tool to achieve competitive

advantage and boost the environmental and financial performance of the enterprise simultaneously. GSCM enables the firm gain more market share, especially in developed countries where ecological sustainability has been incorporated as a market expansion tool to gain competitive advantage, such that environmental considerations were made while establishing fix import regulations such as; prohibiting the importation of products not having an environmental certification such as ISO 14001. He concluded that; environmental regulations, external stakeholders' pressures, EMS adoption, and internal strategic motivations influences the adoption of GSCM, with the most significant influence coming from internal motivations while pressure from external stakeholders has the least impact. Kinyanjui, (2014) also found that GSCM is adopted and implemented by hotels in Kenya, Nairobi due to various factors such as; customer request for environmental-friendly goods and services, but it's applied most notably to gain a competitive advantage as GSCM enables them to cut cost and save resources, therefore boosting its performance. In the same trend, Rozar et al. (2015) found that GSCM is now gaining grounds in Malaysia due to an increase in pressure from customers and some push and pull factors which turn firms towards the “green” initiative. Firms in Malaysia implement GSCM to comply with the established laws and regulations, as a marketing strategy to gain competitive advantage, and due to top management commitment and support. Also, Pepe, (2018) found that the implementation of GSCM is rising in the Greek hotel industry partly due to the benefits obtained from its application such as its direct link to customer satisfaction and demand. In the course of implementing GSCM, he states that most of the hotels in Greece make use of low energy consumption lamps, water-efficient showerheads, environmental-friendly detergents, and a rainwater harvesting and storage facility.

A research conducted by Rha, (2010) with the aim of determining the impact of GSCM practices (external, internal, eco-design factors) on SC performance (resource, output, and flexibility), made use of the principal component analysis and multiple regression analysis to affirm the existence of a strong positive relationship between GSCM practices and the three SC performance parameters, namely; resource, output, and flexibility. The result of his finding enabled him to conclude that; apart from eco-design, GSCM practices improve SC output performance, strengthens; sales, profit, on-time delivery, and the customer service level. He equally concluded that that GSCM does not improve SC resource performance since the extra

budget is usually required in organizations to adopt GSCM practices. Lastly, he found that all GSCM methods positively affect SC flexibility, which is the ability to respond to uncertainty, such as the capacity to handle SC disruptions. Also, Angela (2013) realized that pharmaceutical companies are currently considering implementing GSCM practices. Based on findings and a regression analysis conducted which showed that there is a strong relationship between SC performance and green management practices.

In the same like Angela, (2013) concluded that GSCM practices contribute to boosting the production of pharmaceutical companies' SC. Pharmaceutical companies implement GSCM at the level of supplier sourcing, where they require that their supplier acquire environmental certification, although this is not effectively implemented. Under Eco-design and Packaging, the pharmaceutical companies perform the use of biodegradable materials. In the course of the manufacturing process, pharmaceutical companies minimize the emissions of hydrofluorocarbons and perfluorocarbons. The challenge faced by the majority of pharmaceutical companies is the lack of information about GSCM practices. Malaba, Ogolla, & Mburu, (2014) found out that there is a direct considerable positive correlation between GSCM implementation and procurement performance within the sugar industry in Kenya, and added that the numerous benefits linked to the application of GSCM such as its contribution in reducing and controlling global warming and its associated hazards such as; earthquakes and fall in sea level have drawn the attention of various stakeholders in the sugar industry such that multiple industries adopt it. In addition, Jemutai, (2014) following a regression analysis which proved that there is a strong relationship between GSCM Practices and performance of firms in the automotive industry in Kenya concluded that GSCM contributes to enhancing the economic, environmental and intangible performance of firms in the automotive sector in Kenya such that all the firms in the automotive industry in Nairobi, Kenya recognize the role of GSCM implementation. The implementation of GSCM has enhanced reuse, recycle and remanufacturing opportunities and boosted customer loyalty. Firms implement green procurement through; supplier sorting, where environmental criteria are considered while selecting suppliers, materials are also purchased, considering its environmentally friendly nature, energy-saving equipment is also preferred during purchasing. While implementing green manufacturing, most of the companies make use of helpful environmental substances and makes use of power-saving

techniques. Most companies also implement reverse logistics through the collection of products and package from the environment after its useful life for; reuse, recycling, and remanufacturing. On the other hand, the majority of companies faced some significant challenges while implementing GSCM activities such as the absence of adequate technology and the knowhow to measure GSCM performance. In accordance, Ochieng et al. (2016) also state that the implementation of GSCM activities as a whole does not only boosts organizational financial and marketing performance but is also beneficial to all stakeholders; manufacturer, customer, government and most importantly the environment. They, therefore, recommend the implementation of environmentally friendly activities at all level of manufacturing firms'; procurement of raw materials from suppliers, design, manufacture, packaging, distribution of their products and end of life management of product after its useful life. Control of products after its helpful experience reduces pollution boosts the firm's image and hence its profitability although it is the most ignored part of GSCM by firms. Among suggested solutions, they recommended that the government should institute laws which will support products recovery after consumption from the society, while manufacturers join the government to raise the awareness on the advantages of the collection and recovery of used products and packaging after consumption.

2.1.1 The Conventional Supply Chain

Different authors have viewed SC from different angles. Some see it more as a process, while others see it as a network. Handfield & Nichols (1999) perceive SC as a process comprised of all activities linked to the flow and transformation of goods from the raw material stage, to the end-user as a finished product, as well as the associated information flows. Christopher (1998) instead considers SC as an interconnection of organizations involved in the different processes and activities to produce value in the form of products and services in the hands of the ultimate customer.

The SC as a process begins from procurement of raw materials and ends with distribution to the end-users. SCM includes all the enterprises related to the production process. It is not only the financial chain, the material chain and the information chain that interconnect the suppliers, the manufacturers and the users, but also a value chain. Because the value of the material increases during the processing, packaging, and transportation process in the SC, the enterprises benefits

from it. SCs usually have a core enterprise, which is the organization that organizes and links the production, distribution, retail processes (Wang & Luo, 2010).

The traditional SC differs from GSC in various ways which have been summarized by Sunil et al., (2011) in the table below.

Table 2: Differences between SCM and GSCM

Characteristics	Conventional Supply Chain Management	Green Supply Chain Management
Objectives	Economic	Ecological and Economic
Ecological Optimization	Integrated Approach Low environmental impact	High Ecological Impact
Supplier Selection criteria	Price Switching Suppliers quickly Short term relationship	Environmental Aspects Long Term relationship
Cost Pressure	Low	High
Flexibility	High	Low
Speed	High	Low
Source; Luthra et al., (2011)		

2.1.2 Green Supply Chain Management

The economic or industrial growth led to an increase in the level of energy and material consumption (Seman et al., 2012), which in turn led to the rise in environmental pollution and degradation, which in turn brought about the need for it to be addressed (Laar, 2016), then emerged the concept of GSCM from both SCM and Environmental management (Srivastava, 2007) to tackle the influences and relationship between SC and the environment (Bhattacharjee, 2015).

GSCM involves the incorporation of environmental thoughts into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of

the final product to the customer and, the end-of-life management of the product after its useful life (recycling) (Srivastava, 2007).

The concept of GSC was raised for the first time by the Michigan State University in 1996 during an "environmentally responsible manufacturing" research, where Michigan State University scholars had to prove it to be an effective way of management. It was admired and later adopted by enterprises such as IBM due to its ability to effectively solve the conflict between economic interests and environmental protection. GSCM is a SC concept guided by the sustainable development theories, to improve welfare, achieve compatibility with the environment and material optimization (Wang & Luo, 2010).

The main drivers (internal and external) of GSCM practices have been categorized as; organizational factors, regulation, customers, competitors, society and suppliers. And for organizations facing competitive, regulatory, and community pressures (with more enormous pressures for environmental sustainability), striking a balance between economic and ecological performance has gained more considerations (Firouzabadi et al., 2010).

The GSCM process flows through the entire value chain (from the supplier to the consumer) (Darnall et al., 2008), and investing in this process can be resource-saving, waste eliminating and productivity-improving (Meythy & Martusa, 2013).

GSC is a green system that involves the combined efforts of various actors and elements such as; suppliers, manufacturers, distributors, retailers, consumers, logistics providers, environmental laws and regulations and cultural aspect. It is also a combination of logistics, information flow, cash flow, knowledge flow (Wang & Luo, 2010).

Meythy & Martusa, (2013) made mention of three approaches towards Greening an SC, which is; *reactive*, *proactive* and *value-seeking approach*. In the *responsive approach*; companies engage minimal resources to environmental management, start labelling products that are recyclable and use 'end of pipeline' initiatives to lower the environmental impact of production. In the *proactive approach*; they begin to pre-empt new ecological laws by realizing a modest resource commitment to initiate the recycling of products and designing green products. In the *value-seeking approach*; companies integrate environmental activities such as green purchasing and ISO implementation as strategic initiatives into their business strategy.

The main elements of GSCM practices include; internal environmental management, external GSCM practices, investment recovery, eco-design, just-in-time systems implementing, and the main aspects of GSCM performance include ecological performance, positive economic performance and negative financial performance (Firouzabadi et al., 2010).

2.1.3 Green Supply Chain Management Practices

GSCM practices flow through the entire value chain; from supplier to consumer (Darnall et al., 2008), and various authors have used different approaches to represent these activities or practices. Baojuan, (2009) came up with a diagrammatic representation of GSC activities which he titled “*The flow of Green Supply Chain Management*”, while Hervani et al., (2005) represented GSC using the equation; Green Purchasing/Procurement + Green Manufacturing/Materials Management + Green Distribution/Marketing + Reverse Logistics. This equation has as objective; eliminating or minimizing waste (energy, emissions, chemical/hazardous, and solid residues) along the SC.

The flow of green Supply Chain Management

Looking at the flow of GSC diagram below by Baojuan, (2009), we can identify a number of environmentally conscious activities ranging from green design, green production (certifying suppliers, purchasing ecologically sound products, use environmentally-friendly approach), environmentally friendly packaging and transportation, Green marketing, to the various product end-of-life practices such as recycling or remanufacturing, waste disposal.

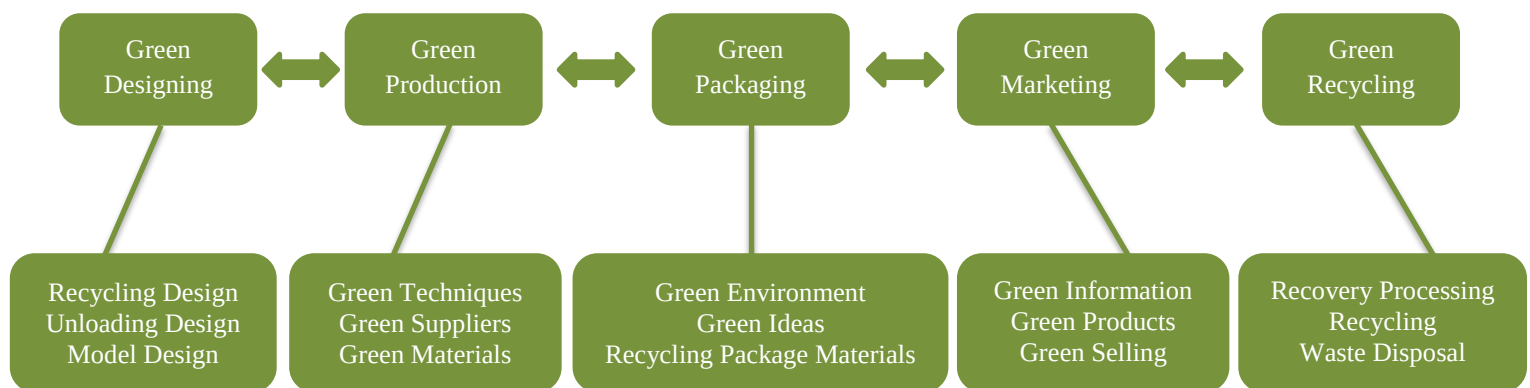


Figure 5: The flow of GSCM

(Baojuan, 2009)

Green Designing

Green Designing involves product designing with environmental considerations (Amemba et al., 2013). According to Baojuan, (2009), it assesses the products' lifecycle (raw material extraction and processing, manufacturing, transportation and distribution, consumption, remanufacturing, recycling and final disposal phase) with sustainable development in view. Green Designing is the systematic consideration of design issues associated with environmental safety and health over the full product life cycle during new production and process development (Amemba et al., 2013), where besides the functions, quality, development cycling, and costs, other relevant designing factors would be improved so as to achieve production with the lowest environmental and resource-related impact (Baojuan, 2009). Green Designing touches various domains including; environmental risk management, product safety, occupational health and safety, pollution prevention, resource conservation and waste management (Amemba et al., 2013). The stages of product development should contain 3R (reduce, reuse, recycling) (Baojuan, 2009). Some conventional approaches in Green Designing include; replacing a potentially hazardous material or process by one that appears less problematic, Designing under legislation and regulations, Designing for remanufacturing, Designing for recycling issues, Considering better choices of material (Amemba et al., 2013).

Green Production / Green manufacturing

Green Production is production processes which use inputs with relatively low environmental impacts, which are highly efficient, and which generate little or no waste or pollution (Amemba et al., 2013). It requires enterprises to undertake clean production methods (with minimum or no waste), make use of reforming technologies and instruments, replacing the hazardous materials, reduce raw materials and resources, to realize low input, high output and little pollution (Baojuan, 2009).

Green production enables the enterprise to achieve lower raw material costs, production efficiency gains (little input and high output), reduced environmental and occupational safety expenses and improved the corporate image (Amemba et al., 2013).

Green Package

Green package, also known as "ecological package", is an environmentally friendly package, which is entirely made of natural plants, can be recycled or reused, be prone to degradation and promote sustainable development (Zhang & Zhao, 2012).

Green Packaging intends to implement Green Package Designing, optimize package structure, and reduce package materials (Baojuan, 2009).

According to Zhang & Zhao (2012), Green packaging has two main functions (protecting the environment and renewable resources) which are achieved through the principles of 4R1D (Reduce, Reuse, Reclaim, Recycle and Degradable).

- Reduce; packaging reduction, packaging products to meet the protection, facilitate the logistics, sales and other functions, it strives to use the least possible material. Enterprises are required to design packages for thin, lightweight, and never use packaging without the need for it.
- Reuse; repeated use of packaging. After simple treatment, the containers can be reused. Reuse of containers can significantly reduce waste volume. To use reusable containers as much as possible will enhance the recycling rate of packaging waste reuse.
- Reclaim, also called recyclable, refers to the use of packaging waste combustion to obtain new energy sources, without generating secondary pollution. Through the recycling of packaging waste, production of renewable products, such as the use of thermal incineration, composting and other measures to improve the land condition, to achieve reuse purposes.
- Recycle, calls can be reused. As far as possible to use low power, low-cost, low-pollution raw materials as packaging material, in particular, the selection of recycled materials should be expanded, which can reduce not only environmental pollution but also saves raw materials, and be hopeful to recycling resources, such as the production of recycled paper board and plastic.
- Degradable is the final packaging waste that cannot be reused and should be able to degrade and not form a permanent waste. For example, select biodegradable packaging materials of paper as more as possible.

Green Marketing

Green marketing is the ecological management of sales of an enterprise, which includes distribution channels, the choice of brokers, on-line trading and sales promotion (Wang & Luo, 2010). Adopting green initiatives and environmentally sound practices such as, setting a collaborative green logistics network (In-bound and Out-bound), forcing suppliers to decrease their transportation emissions as well as making customers aware of this system, can contribute to creating a positive corporate environmental image which can lead to increase their market

share. Lack of the right environmental positive image and social acceptance might cost a successful business' market share on the international platform (Hajikhani et al., 2012).

Green Marketing is a new marketing strategy through which sustainable development and biological balance can be attained. It does not only involve market research, product development, product registration, and sales promotion but also focuses on the natural balance and environmental protection (Baojuan, 2009).

Green Recycling

Green Recycling is a kind of physical distribution from the reverse direction, which is essential for every complete GSC. It represents enterprises' development and environmental protection images (Baojuan, 2009). As time goes on, product life cycles are becoming shorter thereby leading to an increase in consumer waste, robust waste resource and energy waste, which becomes a primary source of environmental pollution thus making green recycling system essential to deal with this problem (Wang & Luo, 2010). Green Products need anticipation on the costs of dealing with and recycling the products and some parts, where the lowest price should be used to obtain the highest returned value (Baojuan, 2009).

Taking a look at the approach made by Hervani et al., (2005) which aims at eliminating or minimizing waste, and reducing cost along the SC and thus represents, GSC using the equation; "GSC= Green Purchasing/Procurement + Green Manufacturing/Materials Management + Green Distribution/Marketing + Reverse Logistics".

Green Procurement

Green procurement also is known as Green purchasing is defined as an environmental purchasing which consist of activities linked to the 3Rs in acquisition (reduction, reuse and recycling of materials in the process of purchasing) (Ninlawan et al., 2010).

In the process, organizations; assess the environmental performance of their suppliers, and require them to adopt environmental-friendly measures so as to guarantee the environmental friendliness of their products, and evaluate the cost of waste in their operating systems, because community stakeholders often do not distinguish between an organization's environmental practice and the practices of its suppliers (Darnall et al., 2008).

Ninlawan et al. (2010) mentioned some activities in Green procurement, which are:

1. Purchase only environmentally friendly materials only from "Green Partners" who observe environmental quality standards and environmental regulations for the environment-related substances.
2. Consider suppliers who acquire ISO14000, OHSAS18000 and other international environmental certifications.
3. Select suppliers who control hazardous substances in the company's standard lists and obtain green certificate achievements.

Green Manufacturing

Green manufacturing involves production processes which makes use of highly efficient inputs, which generate little or no waste or pollution, and has relatively low environmental impacts (Atlas and Florida, 1998). Green manufacturing integrates the reusable or remanufactured components or recycled materials into the production line to realize a zero-waste factory by recycling waste materials (Liu & Chang, 2017).

Green manufacturing can lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses, and improved corporate image (Atlas & Florida, 1998).

Ninlawan et al., (2010) enumerated some activities involved in Green manufacturing such as:

- Hazardous substance control (Rinse parts with clean water instead of using chemicals and reuse water, quality control in inputs at vendor site and recheck before processing)
- Energy-efficient technology (Reduce power consumption in the production process, increase product life-span resulting in higher efficiency and productivity, improve machine uptime, improve machine performance, design product, strive for higher recyclability and % recoverability for products, product exterior using bio-based plastics).
- 3Rs and waste minimization (Promotes reuse/recycle of parts, enhance environmental consciousness via 3Rs activities, reduce indirect materials).

Green Distribution

Green distribution is composed of green packaging and green logistics. Packaging characteristics such as size, shape, and material have an impact on delivery because of their effect on the transport characteristics of the product. Better packaging, along with rearranged loading patterns, can reduce materials usage, increase space utilization in the warehouse and the trailer, and reduce the amount of handling required (Ninlawan et al., 2010).

Green distribution does not only involve the use of environmentally friendly transportation but also includes the shipping of packages back to the factory for reuse (Liu & Chang, 2017).

Some activities involved in green distribution as mentioned by Ninlawan et al., (2010) include;

- Green packaging (downsize packaging, use "green" packaging materials, cooperate with the vendor to standardize packaging, minimize material uses and time to unpack, encourage and adopt returnable packaging methods, promote recycling and reuse program).
- Green logistics/transportation (delivers directly to the user site, use alternative fuel vehicles, distribute products together, rather than in smaller batches, change to modal shift).

Reverse Logistics

Reverse logistics is the process of recollecting product from the final consumer to capture value or proper disposal (Ninlawan et al., 2010). This process is termed Reverse Logistics because it involves reverse distribution, where goods and information flow in the opposite direction from the normal logistic activities (Kroon and Vrijens, 1995).

Some of the key activities involved in Reverse Logistics include; collection, combined inspection/selection/sorting, re-processing/direct recovery, redistribution, and disposal (Ninlawan et al., 2010).

2.1.4 Enablers and De-enablers of Green Supply Chain Implementation

There are factors which favour or disfavour the implementation of GSC practices in an organization, which were summarized and grouped by Stremlau & Tao, (2016) into internal and external factors. The internal factors are those arising from within the organization which involves “people”, “resource” and the “alignment of strategies”, while external factors are those influences independent of the organization, or exterior to the organization such as influences from foreign stakeholders (Competitors, Government, etc) (Stremlau & Tao, 2016). Despite the advantages that come along with GSCM practices, they are not easy to adopt and implement due to various internal and external barriers. The type and magnitude of these barriers will determine the feasibility of GSCM practices in an organization. Organizations, therefore, need an understanding of these barriers to be able to remove the significant barriers and other factors and sub-factors hindering GSCM implementation (Mauricio & Jabbour, 2017).

Internal Factors Influencing Green Supply Chain Implementation

The internal factors are comprised of elements within the organization directly or indirectly influencing Green initiatives both positively and negatively. These factors constitute “people”, “resource” and the “alignment of strategies” (Stremlau & Tao, 2016).

Table 3: Internal factors influencing GSC implementation

Elements/Factors	Internal Enablers	Internal De-Enablers
People	- Top management commitment - Middle management commitment - Employee involvement	- Lack of top management commitment
Organizational	- Foster of culture - Training and Development - Cross-departmental communication	- Organizational reluctance - Lack of training
Resource	- Larger organizations - Knowledge of environmental issues - Technological Advancement - Capabilities within purchasing and supply function	- Smaller organizations - lack of professional environmental knowledge - Lack of information and technological systems
Strategic	- Gaining competitive advantages - Reducing environmental & reputational risk - Alignments with the other strategies - Desire to minimize hidden cost	- Non-alignment with other SCM priorities
Administration	- Performance and reward system	- Reliance on traditional accounting methods - Lack of supportive corporate structures and processes
GSCM readiness	- Existence of sustainable SCM strategy - Environmental Management System adoption - Other internal CSR practices	
Source: Stremlau & Tao, (2016)		

External Factors Influencing Green Supply Chain Implementation

The external factors are comprised of influences from stakeholders such as the Government, consumers, and others.

Table 4: External factors influencing GSC implementation

Factors/ Elements	External Enablers	External De-Enablers
Government	- Government policies and incentives	- Government Regulations
Customers	- Customer demands for sustainability	- Customer desire for lower prices
Suppliers	- Collaboration with suppliers	- Poor supplier commitment
Competitors	- Pressure from competitors	- Pressure from competitors
Other Actors	- Pressure from investors - Pressure from NGOs	
Culture		- Global aspects – cultural barriers and language barriers
Technology		- Information and Communication Technology (ICT) - Technological constraints
Source: Stremlau & Tao, (2016)		

2.1.5 The Supply Chain of Sugar

Sugarcane and beet are the significant plants used in sugar production across the globe. Sugarcane is a perennial grass whose cultivation has a history of about 3000 years while sugar beets have been in use for sugar production since the 19th century. Sugarcane is grown primarily in the tropical and sub-tropical regions of the southern hemisphere in the developing countries of Latin America, the Caribbean and Asia. While Sugar beets are grown in the temperate regions of the northern hemisphere, mainly in Europe and North America, and very little is being produced in the developing countries (Goel, 2014). Our focus is on sugar produced from sugar cane whose SC begins from the cultivation of sugarcane by farmers and ends with the finished product in the hands of the final or ultimate consumer. The main activities involved in the value chain of sugar

include; sugarcane cultivation, harvesting and transportation from field to Factory, sugarcane processing (Kamloi & Chaiprasert, 2014), and distribution.

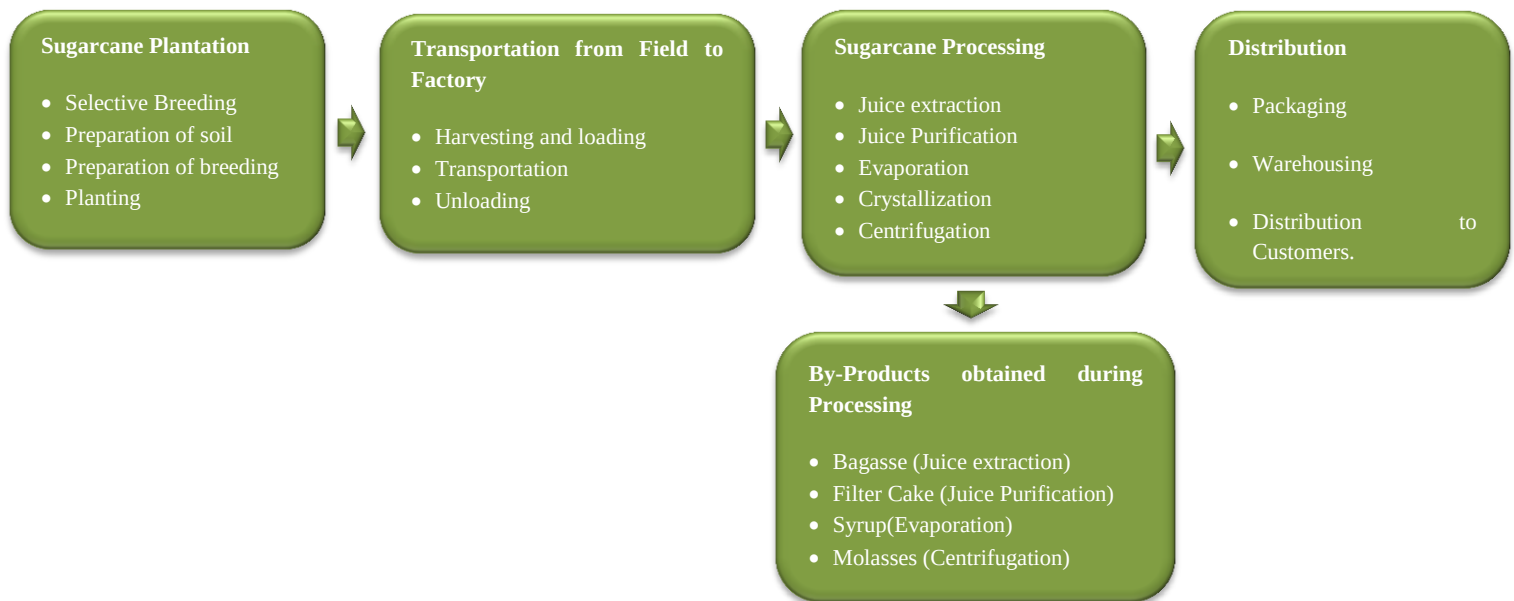


Figure 6: The SC of cane sugar
(Kamloi & Chaiprasert, 2014)

Sugarcane plantation

Sugarcane crop rotation generally covers two years. The stages involved in sugarcane cultivation includes; breeding, preparation of soil, preparation of reproduction, planting (Kasem, 1987). This process also consists of the use of; fertilizers, herbicides, fuel and labour (Kamloi & Chaiprasert, 2014).

Harvesting and transportation from field to factory

Approximately a year after cultivation, sugarcane stalks are cut and transported to the mill, whereas the remaining parts such as the leaves and top are either burned or used for a low-end application. Sugarcane is collected manually and mechanically and transported from the field to the factory (Yosnual & Supsomboon, 2004) (Kamloi & Chaiprasert, 2014).

Sugarcane processing

Sugar processing involved a series of stages such as; juice extraction, juice purification, evaporation and crystallization. For juice extraction, type of milling showed affected on sugar lost in bagasse, filter cake and molasses, which impact to total sugar production (Kamloi & Chaiprasert, 2014).

By-Products

Sugar cane processing yields white sugar and several by-products such as; bagasse (obtained after juice extraction), syrup (obtained after evaporation), molasses (obtained after Centrifugation), filter cake or press mud (Obtained after Juice Purification), (Goel, 2014) (Kamloi & Chaiprasert, 2014).

Bagasse is a fibrous remainder of sugarcane after extracting juice (Kamloi & Chaiprasert, 2014). It can be used as; fuel, nylon production, plastic production (such as the Coca-Cola plant bottle which is was upgraded in 2015 from 30% to 100% bio or plant-based) (Coca-Cola Company, 2015, June 3), the cogeneration of exportable power, paper and pulp industry, chemical industry, animal feed, glass production, etc (http://shodhganga.inflibnet.ac.in/bitstream/10603/96542/12/12_chapter%203.pdf).

Molasses can be used to produce power/electricity and industrial and potable alcohol (such as ethyl alcohol), fertilizer, road surfacing (after mixing with asphalt), ethanol (which can be blended with petrol to be used as fuel for automobiles). The sugar present in the molasses can also be utilized by using molasses directly for the production of; cattle feed, edible syrup, acids (like citric acid, lactic acid, oxalic acid, maleic acid, acid, butyric acid), Solvents and chemicals like ethanol, butanol, acetone, glycerol etc., vinegar.

Fuel ethanol can be used as a substitute for gasoline and also it has the potential to generate revenues through carbon credits.

Press mud or filter cake can be utilized almost entirely as manure, especially in acidic and saline soils, animal feed, wax and fat.

Cane tops and leaves can be used to produce cardboard or wrapping paper, animal feed, and manure, etc. (http://shodhganga.inflibnet.ac.in/bitstream/10603/96542/12/12_chapter%203.pdf).

Some of the challenges faced by the sugar industry are high unit costs of production, low world market price of sugar, and climate change (which is not yet considered as a problem in sugar production) (Mendoza et al. 2014). But these by-products obtained from sugarcane processing enable sugar mills to generate additional revenue (Goel, 2014). And climate change which results from pollution can be reduced through the greening process.

2.1.6 Advantages of Implementing Green Practices

Companies and organizations have various motivations and drivers pushing them towards the green initiative presented by different authors such as Hajikhani et al., (2012) who presented them as follows;

- **External motivations**
 - **Regulatory pressures:** This includes international regulations by international bodies, local administrative or government laws and regulations requiring organizations to take appropriate measures to guarantee environmental safety while carrying out their economic activities.
 - **External stakeholders pressures:** customers, suppliers, and community stakeholders
- **Internal strategic motivations**
 - **Corporate positive image, reputation-led:** Companies adopt green initiatives to achieve "legitimacy", which is usually dependent on the policies and actions approved by the organization. Negative environmental image and social acceptance can hamper on the success of a business which may lose their market share in the global market.
 - **Cost-saving strategy, efficiency-led:** A strategic GSCM can be developed with the purpose of reducing material usage per piece of product, or weight and width and amount of air of the packaging, in order to, lower cost of production which leads to higher productivity in long term, and consequently giving the firms the opportunity to develop and provide a cost-based competitive product to the market. Green practices can enable organizations to generate financial benefits, especially from the 3Rs, (reuse recycle, and remanufacturing), which is one of the most inspiring aspects of GSCM adoption.

- New innovative product and process development strategy, innovation-led; GSCM can be perceived as a modern and innovative managers' strategy, especially for firms making use of innovation as a competitive advantage, by researching various ways to develop products innovatively, both from a technological and organizational point of view. GSC practices can be grasped as an opportunity to increase the business market share and fortify their leadership, giving a sense of uniqueness.
- Environmental Management System adoption; An EMS is a systematic process that companies use, to achieve environmental objectives, policies and responsibilities as well as usual auditing of all of its parts. A growing number of companies are putting into practice the EMS, which is the basis of motivations, which leads to implementing self-regulation method by companies such as ISO 14001 certification or EMAS.

Although companies engaged in greening their SC due to these increasing environmental-related pressure, they simultaneously recognized the various benefits and incentives attached to greening their SCs (Firouzabadi et al., 2010). GSCM has emerged as an essential organizational philosophy in today's competitive environment to achieve both financial and environmental benefits by reducing environmental risks and improving ecological efficiency (Hoek, 1999) (Machogu, 2014). Moreover from the inbound perspective of the SC it is argued that greening the SC has numerous benefits for an organization, such as straightforward cost reduction, integrating suppliers in a participative decision-making process that promotes environmental innovation, encouraging a life-cycle, holistic approach in managerial decision-making, improve organizational performance and enhance a firm's reputation etc. (Nawire et al., 2014) (Firouzabadi et al., 2010). Focusing green practices of an organization within the organization may expose the organization to the negative environmental performance of other organizations in its SC (Eltayeb et al. 2011). A more externally-oriented approach has emerged where a firm extends its environmental responsibility beyond its boundaries and tries to reduce waste and pollution along its entire SC (Amemba et al., 2013). Investments towards greening a SC can be resource-saving, waste eliminating, and productivity-improving (Meythy & Martusa, 2013).

Some practical examples of successful implementations of GSC practices which yielded benefits include; the case of McDonald which is one of the pioneers in the adoption of green practices as stipulated by Verma, (2014), enabled its potato supplier in Austria to process all of the liquid and solid waste obtained from potatoes in the supplier's biogas plant. The solid waste generated is

converted into gas and used to generate electricity for the public and create heat that is used to preheat the dryer for the French fry production process. The residue from the conversion of potatoes to gas is provided to potato farmers for use as a fertilizer. The heat recovery process that powers the dryer produces 4.2 Giga watt-hours a year, and the renewable energy generated from potato waste supplies about 40 % of the electricity and energy needs. Further, substituting plastic bowls with cardboards to serve salad and recycling of the frying oil (that is leftover from its process) towards the creation of biofuel to power its logistical operations have been some of the other proactive green initiatives from McDonald.

2.2 Theoretical Framework

2.2.1 Sustainable Development Theory

Academia long before the late 20th century argued that there need not be a consensus between environmental sustainability and economic development (Emas, 2015), but later in the 21st century, the concept of sustainable development was established with the objective of maintaining economic advancement and progress while preserving the long-term value of the environment. It, therefore, provides a framework for the integration of both environmental policies and developmental strategies (United Nations General Assembly, 1987). The concept of sustainable development is one which evolves as we learn to grasp its full implications for all aspects of our lives. The World Commission popularized the term "sustainable development" on Environment and Development (WCED) in its 1987 report entitled "Our Common Future", and also referred to as the "Brundtland Report", after the Chair of the Commission and former Prime Minister of Norway, Gro Harlem Brundtland (Unesco, 2010).

The sustainable development approach states that; genuine evolution can only be effectuated in Third World countries and the world at large if the strategies adopted and implemented are environmentally viable (Barbier, 1986); implying that there can be no durable development or consistent growth without engagements towards environmental preservation, and rational use of resources.

Various definitions have been attributed to the term 'sustainable development' depending on the local contexts, needs and interests, but the most popular and most used definition is that of the

Brundtland Commission. The World Commission on Environment and Development, (1987) perceives SD as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This perspective evokes the rational use of resources to ascertain societal welfare for the present and the future. Goodland & Ledec's (1987) perception of the term 'sustainable development' is most appropriate for our research. They perceive 'sustainable development' as a pattern of social and structural economic transformations which optimizes the financial and other societal benefits available in the present without jeopardizing the likely potential for similar interests in the future. This perspective portrays sustainable development as an economic activity that improves 'social well-being', 'maximizes resource conservation', and 'minimizes environmental impact'. Porter & Linde (1995) argue that strict environmental regulations can stimulate the innovative capacity of an enterprise, thereby enhancing its competitiveness. The concept of SD has evolved from being merely perceived as a business cost for environmental protection, to an essential, integral business component for the firm's shareholders (Ziolo et al., 2015). Any enterprise integrating SD as part of its business strategy and ethics engages itself in achieving a viable development which takes into account societal and environmental values while implicating both internal and external actors to the company (Ghislaine, 2011).

The term sustainable development has gained a lot of attention in various domains such as in our day-to-day life practices, international negotiations, the scientific, political, marketing, business and other fields (Ziolo et al., 2015), and should be applicable at all levels in the society, and in every domain within enterprises. According to Behringer & Szegedi (2016), "The business sphere plays a broader role in SD, and it has become clear by now that CSR contributes to the sustainable development of the business sphere and without that sustainable development cannot be attained". The latter demonstrates in their analysis the increasing strong interaction between SD and CSR concepts in recent years to the point that "CSR is considered to be an integral part of sustainable development'.

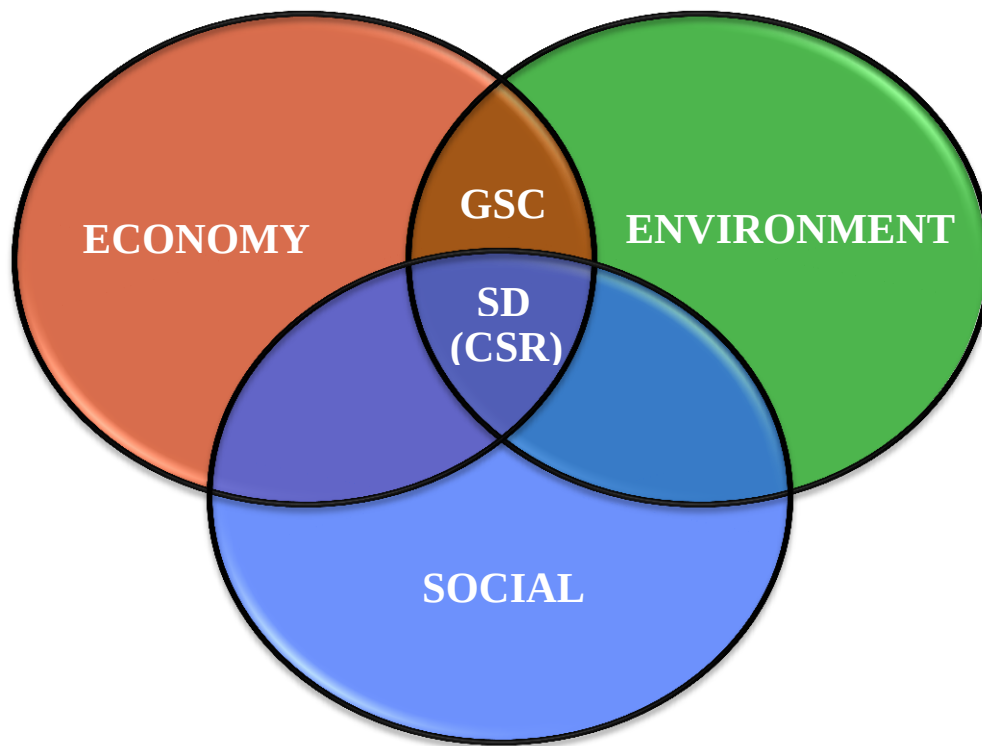


Figure 7: THE THREE PILLARS OF SUSTAINABILITY
(Green Planet Ethics, July 20 2018)

The main principle of SD underlying all others is the integration of economic, environmental and social concerns into decision making (Emas, 2015). These three aspects, termed by some authors as the three dimensions/pillars of SD, have to be considered to achieve sustainability. They include the ecology (environmental), social responsibility (society) and commercial advancement (economic) aspect (Nyfeler, 2013) (Hopwood et al., 2005). Both scientific and more anecdotal study reveals that humans are the cause for climate change and other environmental issues such as the loss of biodiversity and the salinization of soil, mainly due to their activities or interactions with the environments such as their modern production and marketing methods. Humanity and society depend on and live within the context and carry out economic activities within this environment. The environment cannot, therefore, be ignored (Hopwood et al., 2005). These three pillars of sustainability were derived in a concept called “Green Economy”, and includes; the economic (profit), environmental (planet), and social sustainability (people) (Green planet ethics, 2018, July 20). Environmental sustainability ensures that current interaction with the natural environment should be done while preserving the natural environment as much as possible. Natural resources should be used with moderation such that the funds can be replenished

naturally, and will not jeopardize consumption by the future generations. Environmental degradation has a long-term effect on the inability to sustain human life, and will, therefore, lead to the extinction of humanity (Green planet ethics, 2018, July 20). To guarantee a sustainable future, the needs of everyone must be met equally, such as sanitation, food security, and no one should be exploited in the process of another meeting his lack. GSCM has its place within two pillars or aspects of SD. SCM is firstly economic in nature and exists purely for commercial purposes as seen in our literature review, while the green concept is environmental. We can, therefore, identify GSCM between two aspects of sustainability, namely; the economic and ecological dimension as seen in the diagram below, whereby companies carry out their business activities considering environmental wellbeing.

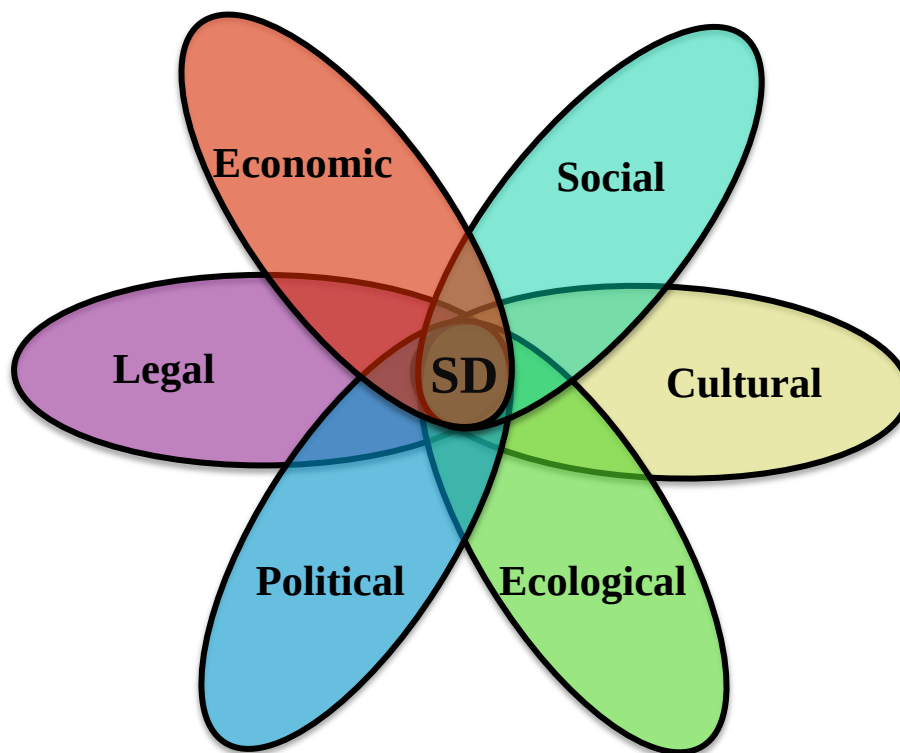


Figure 8: PAID’S Six Pillars of Sustainable Development
(Essia, 2015)

On the other hand, the Pan African Institute for Development (PAID) came up with six pillars of SD namely; Social, Economic, Legal, Political, Ecological and Cultural pillars as seen in the diagram below. PAID opts for an equitable and inclusive development which promotes the progress of all social classes without discrimination of any kind, where fair and effective justice

is available to all, which can only be achieved with the right and favourable political leadership which adopts appropriate policies, and enhance economic activities, promote local production with the available resources while minimizing importation which is unsustainable and promote green practices such as the regenerative use of natural resources, the use of renewable energy, recycling thereby leading to the creation of greener jobs (Essia, 2015). But our findings shall focus more on the three pillars of SD.

2.2.2 Green Economy Theory

The Green Economy concept is an environmental economics concept which emphasises on how the economic system can pursue growth by bringing together economic, environmental, social, and technological aspects through the expansion of clean energy production, distribution, and consumption (Mundaca, 2015). Green economy incorporates products, processes and services having a minimal environmental impact. It is not limited to; the ability to produce clean energy, but equally involves the adoption of technologies that allow cleaner production processes, as well as the growing market for products which consumes less energy (Newton & Cantarello, 2014).

The International chambers of commerce (2011) perceives the green economy as an economy within which economic growth and environmental responsibility work together in a mutually reinforcing fashion while supporting progress on social development. This perspective brings out the; economic, environmental and social aspects which are also seen in sustainable development as; the three pillars of sustainability (Nyfeler, 2013). Green economy is characterized by a considerable increase in green investment, which include investments in sectors such as; renewable energy, low-emission transport, energy-efficient building, clean technologies, waste management improvement, sustainable agriculture and forest management and sustainable fishing, which plays a significant role in minimizing ecological deficiencies and environmental threats (UNEP, 2010). The Green Economy concept was popularized, and integrated international development dialogues after the 2008 global financial crisis as national governments and international organizations attempted to derive ways to revitalize the economy more sustainably (UNDESA, 2012) (Newton & Cantarello, 2014). The primary reason surrounding the emergence and development of the concept of the green economy is the

movement towards a more integrated and comprehensive approach to incorporating the environment in economic processes (Kasztelan, 2017).

2.2.3 Stakeholder Theory

The Stakeholder theory states that managers should take decisions taking into account the interests of all the organization's stakeholders, and not only that of shareholders as said in the traditional shareholder theories (Jensen, 2002). Stakeholders, according to Freeman, (1984), include all individuals or groups who can substantially affect the welfare of the firm or is being affected by the achievement of the firm's objectives. The multiple stakeholders of an organization have different expectations or interests which might even conflict at specific points, but the management has to strike a balance between those conflicting expectations to achieve the organizational goals. This, therefore, extends the duty of organizations from merely financial and economic responsibilities towards its shareholders to social and environmental responsibilities towards the society. Fontaine et al., (2006) views an organization as a grouping of stakeholders, which exist to manage the interests, needs and viewpoints of both the shareholders and the stakeholders. In the same like Freeman et al. (2003) stated that stakeholders have the right to pronounce themselves on how resources are being allocated, and their involvement can lead to the creation of new opportunities for value creation. Some academia proceeded in the categorization of stakeholders such as; primary and secondary stakeholders (Savage et al., 1991), external and internal stakeholders (Sirgy, 2002), strategic and moral stakeholders (Goodpaster, 1991), voluntary and involuntary stakeholders (Clarkson, 1995).

2.2.4 Gaps Identified

GSCM is a new concept which emerged from both environmental management and SCM, and it's still gaining grounds in Cameroon. Therefore, there is limited literature on GSCM in Cameroon. However, in the course of this research, we have found some documentation on SCM, in related domains in Cameroon. This research work timely fall in place to fill in the gap that exists in GSCM in Cameroon and specifically in the area of Sugar production.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Model Specification

This research aims at analyzing factors promoting and those obstructing the implementation of GSCM of sugar in Cameroon. A wide range of activities makes up GSCM, as seen in our literature review. The application of these activities is determined by certain factors referred to as enablers and de-enablers in our study. The model constructed to carry out this study makes use of variables identified in our literature review in similar research projects which has undergone some academic scrutiny such as Stremlaau & Tao, (2016). Our model constitutes 12 independent variables and one dependent variable. The independent variables have been grouped into two major categories, which are Internal and External factors, whereby 6 of the independent variables are external, and six are internal. Each element or variable can either be an enabler or a de-enabler. This derived model has “Green Supply Chain Management” as a dependent variable, and the independent variable consisting of:

Internal variable: interdepartmental communication, internal stakeholders’ influence, organizational strategy, financial resources, company size and technology.

External variable: shareholders, competitors, suppliers, customers’ behavior, external communication, and the legal and institutional framework.

This study will be analyzing to what extent these variables influence GSCM.

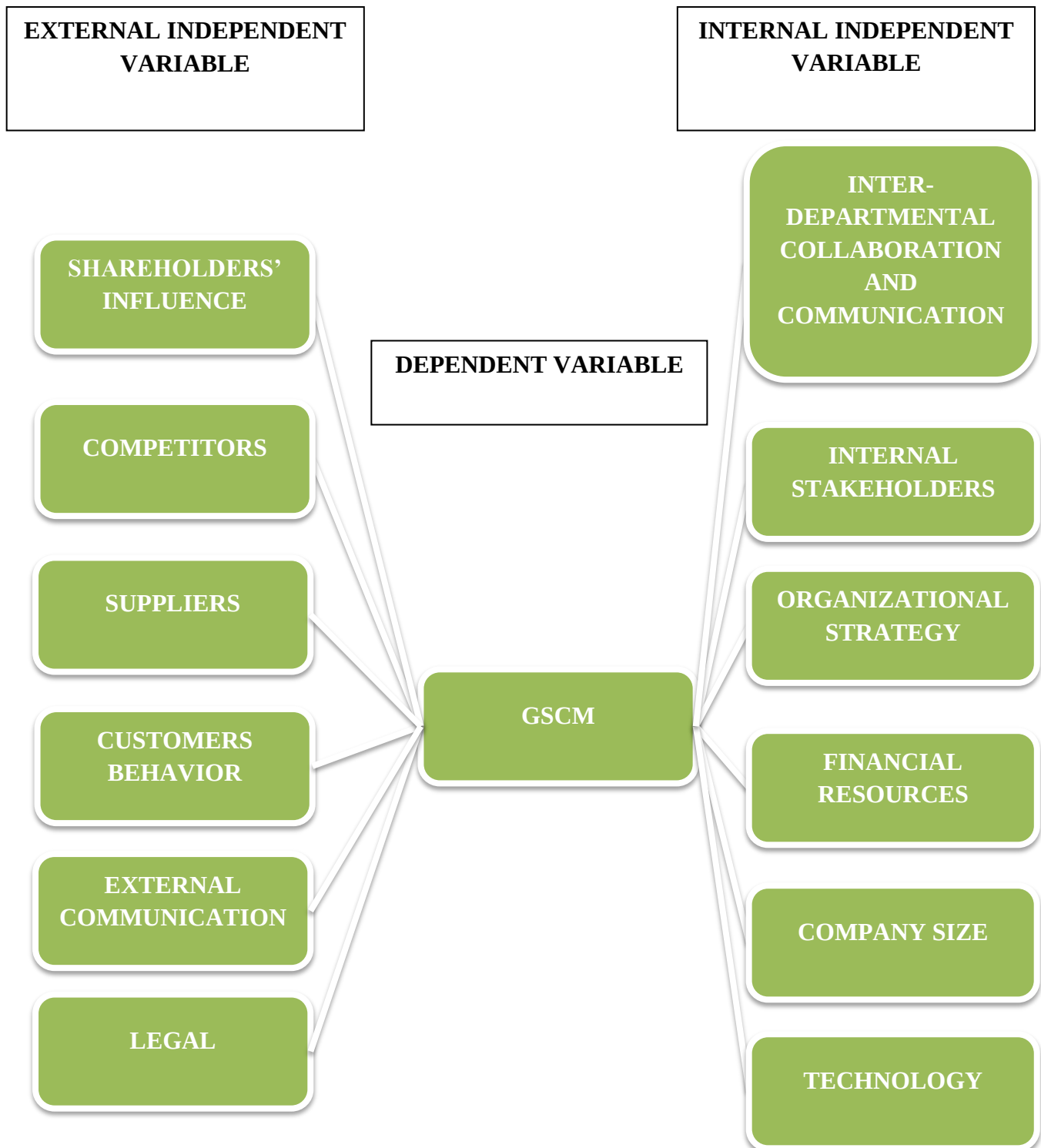


Figure 9: Enablers and De-enablers of GSCM in SOSUCAM
(Researcher, 2018)

3.2 Description of Variables in the Model

Twelve significant variables are highlighted in this academic work. These variables were derived from our literature review, from other similar researches such as Kerstin & Joanne, (2016) which has undergone some academic scrutiny. GSCM is our dependent variable, and we have the following independent variables;

Internal variable: interdepartmental communication, internal stakeholders, organizational strategy, financial resources, company size, technology.

External variable: shareholders' influence, competitors, suppliers, customers' behavior, external communication, and the legal and institutional framework.

We made use of both qualitative and quantitative data to measure the independent variable. The various data were obtained through primary and secondary sources such as observation, interviews, questionnaires, archival search, and internet.

Internal Independent Variables

The Interdepartmental communication variable in our work consists of how well cross-departmental communication is carried out within the company. The indicator was obtained through the level of awareness of the workers from various departments, perception of green practices, availability or unavailability of avenues or opportunities for exchange of knowledge. The "Internal stakeholders" variable involves employees and management commitment from various departments towards the implementation and development of a GSC. Because the participation of all the employees is vital for the successful implementation of GSCM and commitment from managers is also very crucial without which, there can be no implementation GSC. It is also essential to take into consideration if the employees have the capacity of implementing GSCM. This variable also took into account the availability or deficiency of environmental and sustainable development experts.

From an Organization's strategy, we can determine the management's commitment to green practices, since they are the ones to establish and ensure the applicability of these strategies. The availability of training and development is a positive step. Furthermore, incorporating

sustainable supply chain methods in this training and development program is necessary to instil a sense of engagement and ecological consciousness in employees.

The indicators used in the "organizational strategy" variable in our study entails; SOSUCAM's organizational values; governing its employees' behaviour, how favourable these values are to the development of GSC. It equally considers if the adoption of GSC goes in line with the other organisational strategies such as; profit maximization, cost minimization, competitiveness, reputation and innovation. Some of these values considered are Training and development sessions on environmentally sustainable practices and sustainable development, adoption of corporate social responsibility practices, and the company's focus while in competition; price, quality, environmental integrity, etc.

Adopting environmentally sustainable measures involves a high cost within the short term and will benefit only over time. The Financial resource variable in this study, therefore, made use of the liquidity of the company as indicators.

According to Kerstin & Joanne (2016), from a resource-based perspective, larger organizations are most likely to adopt GSCM due to the availability of human and financial resources at their disposal. Implementing GSCM is financially demanding, and also highly demanding on the human resource, which is usually a challenge in small enterprises. Obtaining the required modern ICT equipment requires finances. As for indicators, we therefore, considered the number of employees, and the financial situation of the company regarding the company size variable.

The indicators used to measure the "Technology" variable in our study involve the availability of relevant technological tools; the use of outdated machinery can render difficult the implementation of GSCM. The degree of receptiveness or reluctance of the company management in the acquisition of new and modern technology was equally vital in our analysis.

External Independent Variables

The Shareholders' influence variable considered whether there is pressure from investors on SOSUCAM to adopt environmentally viable practices, or it is just increasing profitability from SOSUCAM.

If a company adopts environmental measures, its competitors are most likely to follow. If a company's competitors adopt GSCM strategies, this will likely put pressure on other company to follow suit. The Competitors variable in our study considered the presence or absence of pressure from SOSUCAM's competitors to adopt green practices. The orientation of the competition in the sugar market is equally a determining factor whether the competition is focused on lower prices, environmental sustainability, etc. according to the customers' demand.

Supplier's environmental commitment is essential to achieve a sustainable or GSC. According to Kerstin & Joanne (2016), Companies are often held responsible for the performance of their suppliers and partners, including environmental performance. We considered the degree of collaboration that exists between SOSUCAM and its suppliers, geared towards the achievement of a GSC. We equally considered the existence or absence of environmental-based criteria in the supplier selection and product sourcing of SOSUCAM. The survival and prosperity of

SOSUCAM depend absolutely on its clients. These clients have the power to enable GSCM in SOSUCAM by requiring the enterprise to adopt environmental-friendly measures and communicate these measures. The Customers behavior variable in our findings have as indicators the absence or presence of pressure from these customers on SOSUCAM to adopt environmental practices. This influence from customers will lead to the creation of channels of communication to inform the customers and potential customers on the execution of these measures. Other factors taken into consideration include; the level of environmental consciousness of customers while purchasing sugar. Be it ecological integrity of the company or the demand for lower prices on sugar by customers.

The External Communication variable considered the level of communication between SOSUCAM and its customers, with emphasis placed on environment-related communication not leaving out the nutritional facts of their sugar. Because if the enterprise is conscious of the fact that it has to communicate the measures implemented, it will be pushed to do more to use it for publicity.

The Legal and institutional framework variable in our context touches the presence or absence of national and international laws and regulations regarding business practices, health and environmental protection from regulatory bodies such as Environmental protection laws,

consumer protection laws, and health and safety requirements. This variable also included the presence or absence of Government incentive to environmentally sustainable enterprises, influence from institutions such as ministries, quality control organizations, NGOs.

This work made use of both the qualitative and quantitative approach, and the data collection was carried out through; Interviews, questionnaires, observation, and archival or traditional library research. Various indicators were used per variable to derive data on each variable. This work made use of 13 variables, of which 12 are the independent variables and one dependent variable.

3.3 Study Design

This research is exploratory and does not intend to offer a final and conclusive solution, but to bring more highlight on the nature of the identified problem for further studies and consideration in significant decision making (Nargundkar, 2008). Thus, the focus of this study is to identify and analyze the enablers and de-enablers of GSCM in SOSUCAM.

A visit was effectuated at the SOSUCAM factory sites located both at Banjock and Nkoteng to carry out this research, which is our case study. Fieldwork was carried out through interviews with part of the management and employees of SOSUCAM for the collection of reliable qualitative primary data. Questionnaires were also administered to the customers of SOSUCAM for the collection of reliable primary data associated with customer's behavior in both the Littoral and Centre regions, partly through social media, and physically. A visit equally took place at the SOSUCAM warehouse in Yaoundé – Nlongkak for some data collection. Our research similarly made use of secondary data obtained from libraries, internet search, and archival search such as books. Once the data collected, the quantitative data was inputted into the computer system and analyzed using Statistical Package for the Social Science (SPSS). After the analysis of the qualitative and quantitative data obtained, interpretation and conclusions were made.

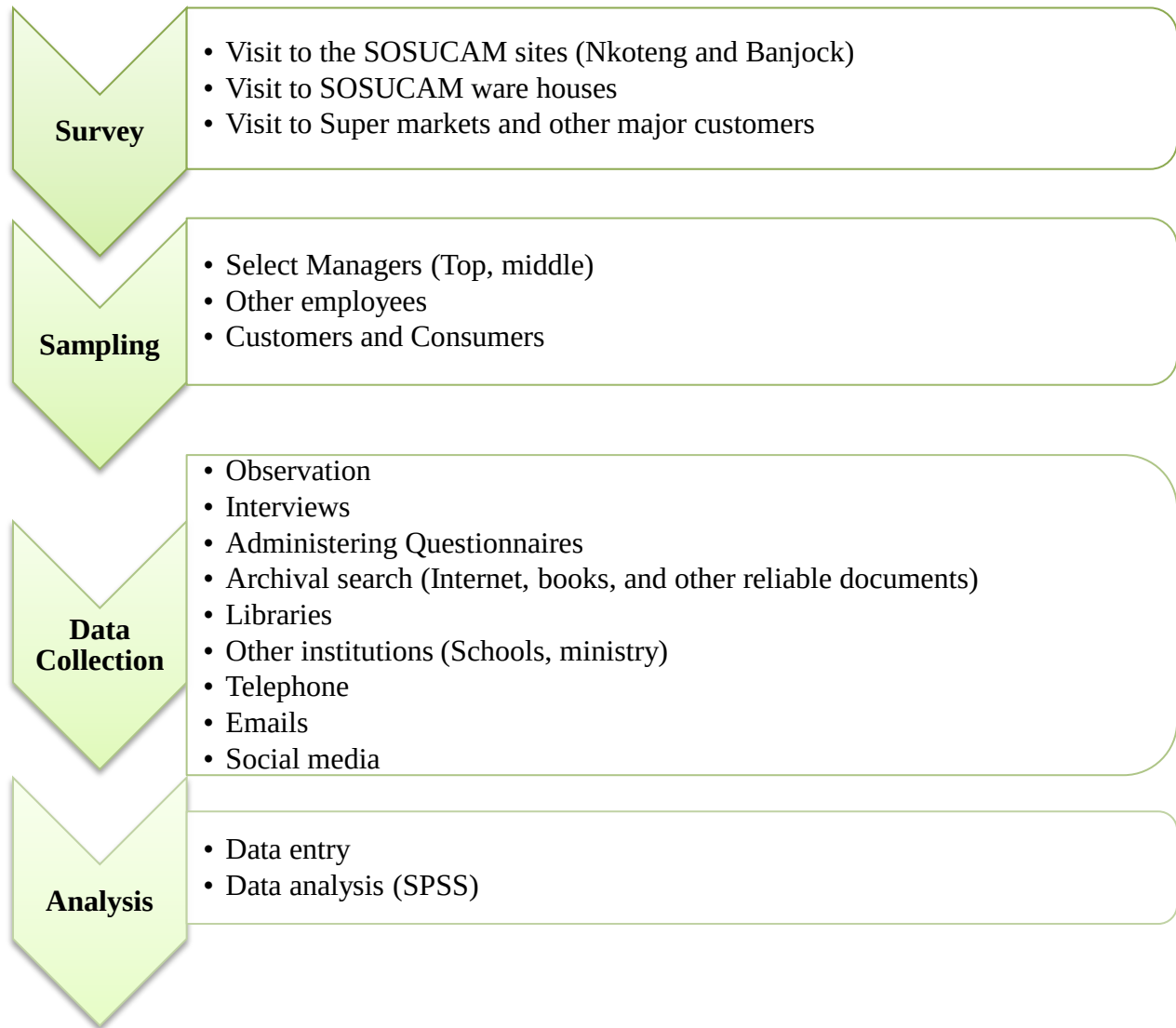


Figure 10: Study Design

(Researcher, 2018)

In the course of our study, we gained comprehension of SOSUCAM's employees' perception of GSCM and their commitment towards implementing it. Our survey equally enabled us to obtain information regarding the nature of the company, whether it is a supplier, manufacturer, retailer, or it's involved in all three.

Our questionnaire was structured mainly to tackle the customer behavior variable, while the interview guide was structured to generally reflect both our internal and external independent

variables. It is required of each respondent to evaluate the strength of each indicator using the *Likert scale* on the questionnaires, for the collection of quantitative data.

The design of our interview guides and questionnaire gives us the possibility of an in-depth analysis of the results obtained from a few respondents. The questionnaires and interview guide have been prepared per group of the respondent. The researcher developed a questionnaire for SOSUCAM's customers and an interview guide for SOSUCAM's managers.

Study Population

Our study population in this research constitutes SOSUCAM management, employees, and customers. The managers will include top and middle managers, while the other employees will be randomly selected. In the same light, and customers of SOSUCAM will equally be chosen randomly. The majority of the study population is French-speaking, and so the researcher provided them bilingual questionnaires (French and English).

3.4 Analytical Approach

This research work is more of exploratory considering that only a few studies have been carried out (Brown, 2006) concerning the enablers and de-enablers of GSCM implementation in the Cameroon Sugar industry. We also made use of both qualitative and quantitative analysis. The analysis was done through observation or personal judgment, and equally with the help of the Statistical Package for the Social Science (SPSS).

3.5 Validation of the Result

This research was carried out following the standard methodology and deontology for research in social sciences. Furthermore, the result obtained from this research was acquired through the use of data depicting Cameroon's field realities. All information and data presented in this research were obtained from reliable sources such as; research papers, official web-site, SOSUCAM workers and its management personnel. This work was equally carried out with the help of a supervisor and approved after having gone through some scrutiny.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

This chapter presents and analyzes both the primary and secondary data obtained in the course of our fieldwork. It begins with a description of the environment of study, the general and demographic characteristics of the respondents such as; gender, age group, location, etc. It proceeds with a discussion on findings, tackling the main and specific objectives of the finding. This chapter further shows the limitation of the study.

4.1 Demographic Characteristics of the Respondents

This research made use of both qualitative and quantitative data collected from various sources to suit both the internal and external variables which have different respondents. The interviews which generally provided the weightier content of the data needed in this work, was administered to 5 representatives of SOSUCAM's management. As per the external variables, questionnaires were administered to a total of 205 respondents from sugar household consumers selected at random from the Centre and Littoral regions to reflect the situation in the Cameroonian territory.

Table 5: Percentage of respondent per region

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Center	122	59.5	59.5	59.5
Littoral	83	40.5	40.5	100.0
Total	205	100.0	100.0	

(Researcher, 2018)

Among SOSUCAM's customers, 122 respondents were sampled in the Center region, which represents 59.5 % of our sampled consumers, while 83 respondents were sampled from the

Littoral region, which equates to 40.5% of our sampled consumers. The Littoral and Center regions were selected because they host the economic and political capital of the country, and can, therefore, be a reflection of the situation in the country. Representatives of the government were also interviewed from various government structures such as MINMIDT (Ministry of Mines, Industry and Technological Development). Staff representatives of SOSUCAM's industrial clients were also interviewed in the course of our research, such as SABC, Nestle, and Fermencam. On the other hand, concerning the internal variables, 5 staff representatives of SOSUCAM were interviewed, and some randomly selected employees from SOSUCAM. The researcher equally interviewed staff representatives of SOSUCAM's collaborators, such as SECA.

4.1.1 Gender of respondents

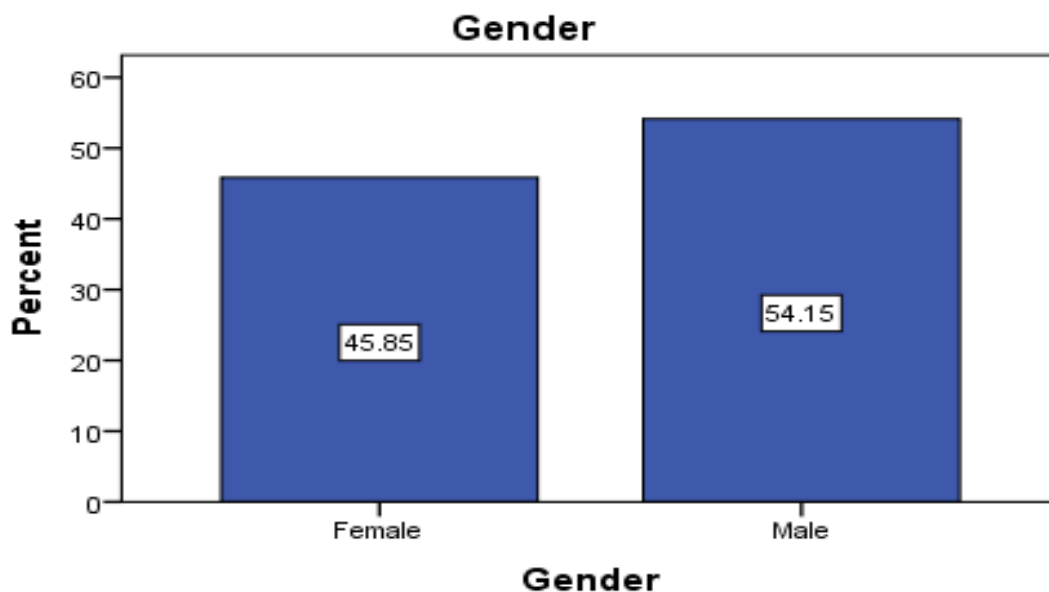


Figure 11: Gender of respondents

(Researcher, 2018)

Among the interviewed personnel from whom qualitative data was collected, 3 were Males, while 2 were females. Among the sugar consumers, 54.15% of the respondents were males, while the remaining 45.85% were females.

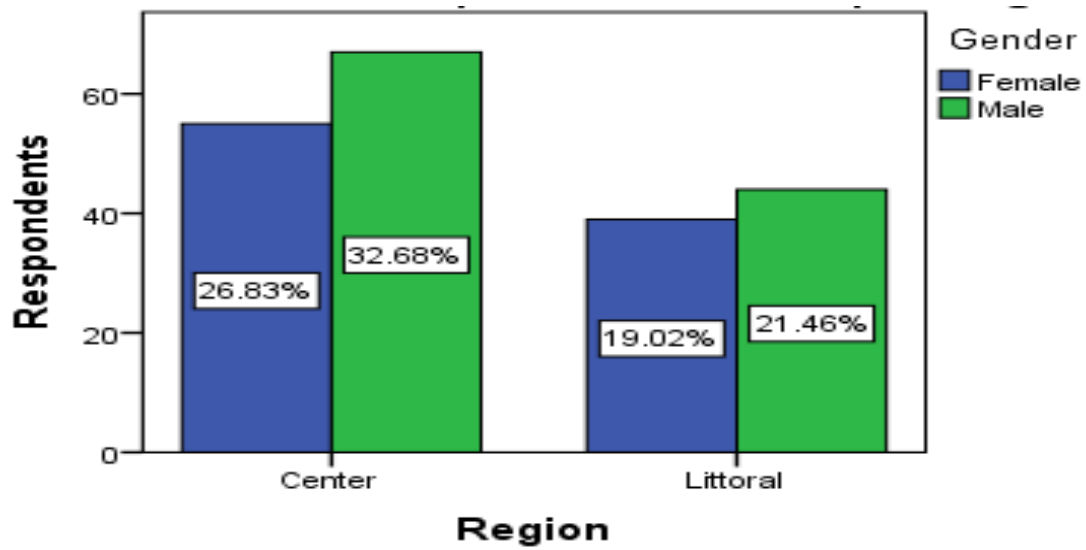


Figure 12: Gender of sampled consumers per region

(Researcher, 2018)

In the Centre region, 32.68% of the sampled sugar consumers were males, while 26.83% were females. In the Littoral region, we had 21.46% of males and 19.02% females.

4.1.2 Age group of respondents

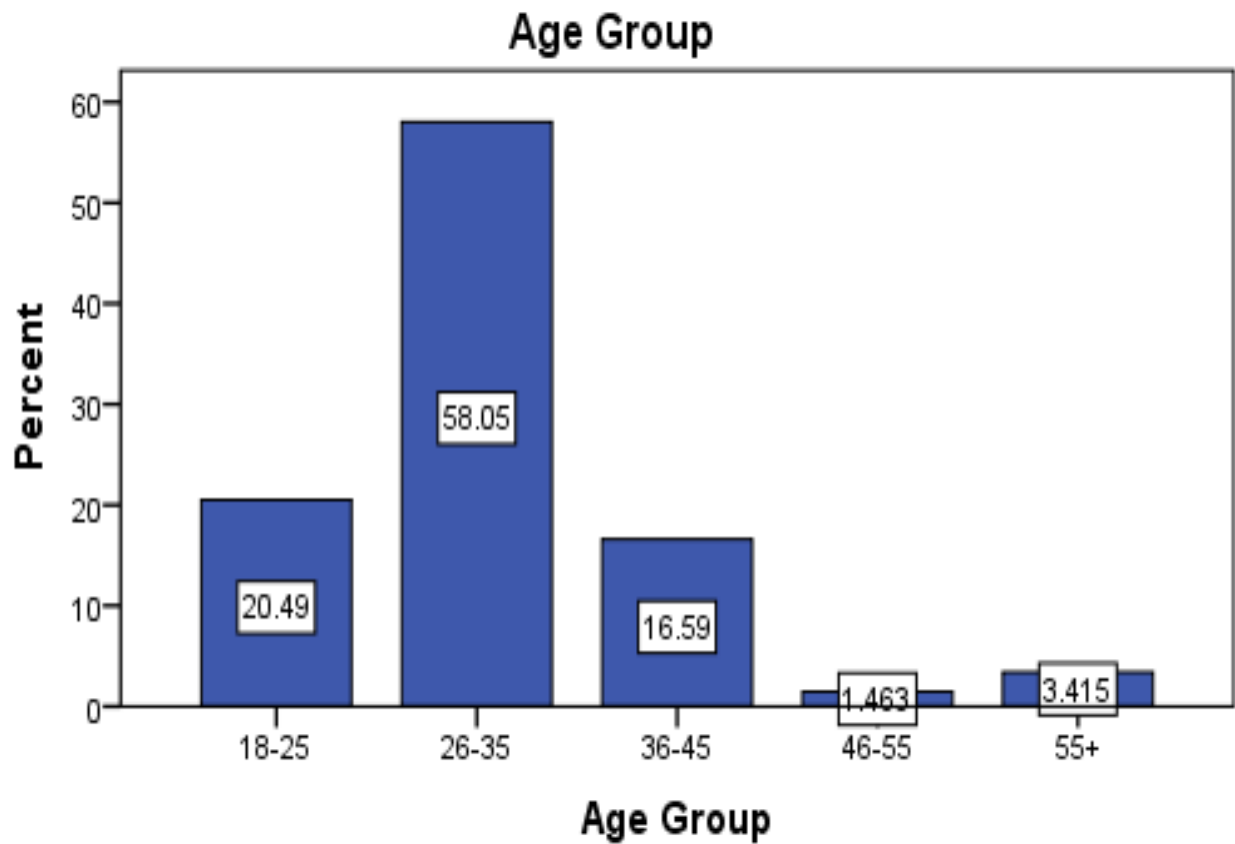


Figure 13: Age group of respondents

(Researcher, 2018)

Based on the statistics presented in figure 13 above, a totality of 20.49% of the sampled consumers belonged to the age group 18-25 years, while 58.05% had an age range of 26-35 years, while 16.59% belonged to age group 36-45, 1.46% had an age range of 46-55years, and 3.41% had above 55years.

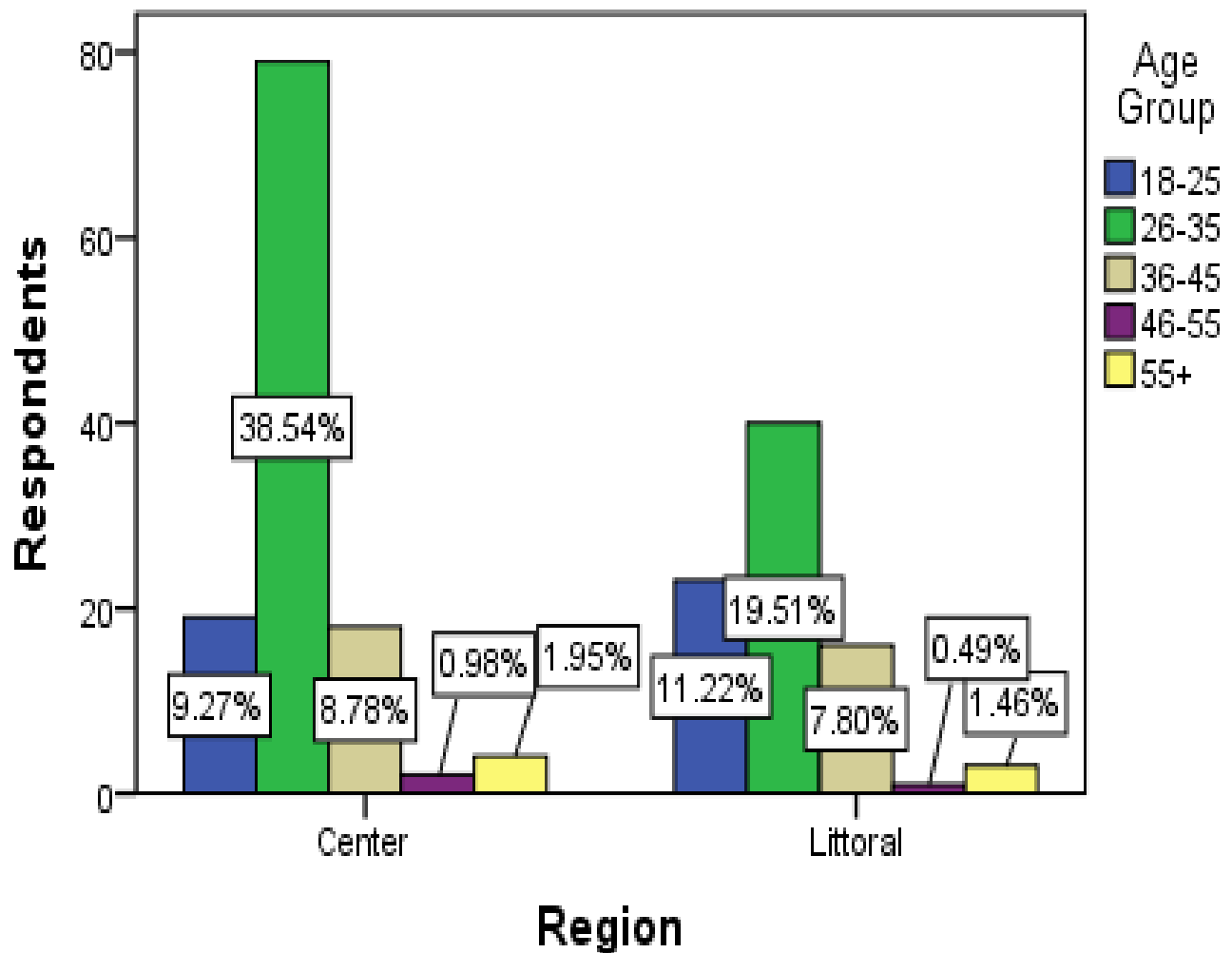


Figure 14: Age-group of respondents per region

(Researcher, 2018)

In the Centre region, 9.27% of the consumers had an age range of 18-25 years, while 38.54% were between 26-35 years, while 8.78% belonged to age group 36-45, and 0.98% were of age range 46-55years, and 1.95% had more than 55years. On the other hand, the Littoral region had 11.22% of the sampled consumers belonging to the age group 18-25years, while 19.51% were of age group 26-35 years, while 7.80% had an age range of 36-45, and 0.49% had between 46-55years and 1.46% where above 55years.

4.2 Results of the Finding

This section presents and discusses the results of the findings per the research question.

4.2.1 What are the factors promoting or obstructing the development of GSCM in SOSUCAM?

The variables or factors analyzed in this research question were obtained from our literature review, and the analysis of these enabling and de-enabling factors will be based on documentation and interview granted by various experts within SOSUCAM and some of its collaborators such as SABC, Nestle, Bureau VERITAS, and others. To identify these obstructing and enabling factors to GSC implementation, both qualitative and quantitative data were collected.

4.2.1.1 External variable

4.2.1.1.1 Shareholders' influence

The significant shareholders of SOSUCAM are the SOMDIAA group which hold 72.72% of the shares in SOSUCAM, and the Cameroon government which holds 15.02% as seen in our literature review, there equally are other private shareholders. One of the major preoccupations of the SOMDIAA group is environmental welfare and sustainable development (SOMDIAA, 2019). SOMDIAA group being one of the significant shareholders of the company with the most considerable amount of shares gives the orientation it wants to its companies. If environmental welfare does not fall within the priorities of the major shareholders, they will likely not include it in one of the concerns of the company, but according to SOMDIAA's publication on their website, as far as environmental safety is concerned, SOMDIAA has taken specific measures such as; ensuring that all the enterprises of the SOMDIAA group have an organized system for environmental management, associated with the quality control unit which strives to minimize the negative impacts of the enterprise on the environment. Each enterprise has a QSE unit which constitutes of a General Director and other resourceful persons which among many have as duty:

- The execution of environmental impact assessment, and put in place environmental management plans;
- The establishment of measures against soil erosion, and practice sustainable fertilization;
- The regulation of water consumption, rainwater harvesting, and drip watering system;
- The sorting and recycling of waste, the valorization of plastic waste;
- The minimization and treatment of liquid discharge (by putting in place a factory wastewater decantation basin, hydrocarbon separator, and an oil removal station);
- The planting of trees;
- The control of energy consumption and energy production from biomass (Bagasse).

The Cameroonian Government, on the other hand, is equally preoccupied with environmental safety and protection such that it has enacted some laws and ratified some international and regional conventions governing the business sector and which are associated to environmental care seen more elaborately in the Legal and institutional framework variable. Some sanctions have been put in place as well by the state to enable the non-violation of the laws and standards put in place. The government unit that was established to cater for environmental management is The Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) which was established to ensure the implementation of government policies patterning to environmental management, and the protection of nature towards the achievement of sustainable development. This ministry equally takes part in the negotiations for international and regional conventions and agreements linked to environmental protection. There similarly are other public administrative units of technical decentralization which have duties related to environmental management to assist implement the government policy of environmental management such as; ANOR, ANAFOR, ANRP and ONACC. The shareholder variable, therefore, constitutes an enabling factor for GSCM implementation in SOSUCAM.

4.2.1.1.2 Customers behavior

SOSUCAM has mainly 3 categories of clients as seen in our literature review, which is; the industrial customers, the wholesaler network and the CHR (Cafés, Hotels & Restaurants) segment. Among SOSUCAM's industrial clients; Nestle and SABIC were sampled; on the other hand, the final consumers or household consumers too were sampled per region. The industrial

buyers purchase sugar for further production while the wholesaler network and the CHR segment purchase it for direct consumption by their customers. In our study, we divided customers into two major groups, which are the industrial and household customers.

The absence or presence of pressure from both SOSUCAM's clients and consumers will determine its urge to adopt environmentally friendly measures since its existence and survival is determined by its clients who contribute directly and indirectly to its survival and prosperity by purchasing its products.

SOSUCAM supplies brown sugar to Nestle, and in case of shortage of brown sugar, SOSUCAM supplies white sugar. This sugar enters the manufacturing process of Nestle products where it is being used as an ingredient in the production of; Maggi, sweetened condensed milk, Nido choco, and other Nestle products. Nestle emphasizes on the quality of this sugar which is being analyzed and tested by laboratories both internal and external to the enterprise to ensure the sugar was produced following the established norms (Representative of Nestle S.A, Personal communication, February 22 2019). SABC is one of the significant customers of SOSUCAM purchases "Tip-Top sugar" from SOSUCAM basing itself on stated specifications (Operations officer of SABC S.A., Personal communication, February 21 2019). Tip-Top sugar is a premium rough-refined granulated sugar which meets the exacting requirements of agro-industrial companies such as carbonated drink and beer makers (SOMDIAA, 2019, February 28). The quality of this sugar is controlled at all levels of their supply chain by the quality control department of SABC. Both companies have specifications on the quality of sugar they expect from SOSUCAM, but they lay no emphasis on the environmental image of SOSUCAM, and neither puts pressure on SOSUCAM to adopt environmentally sustainable practices and even to obtain an environmental certification such as ISO 14001.

According to the communication officer of SOSUCAM, The Coca-Cola Company is one of SOSUCAM's major industrial clients goes beyond the exigency of high-quality sugar, and even required SOSUCAM to obtain another certification linked to alimentary production, and they are working towards obtaining this certification with the coming of an audit team which was scheduled for March 04, 2019 (communication officer of SOSUCAM, Personal communication, February 21 2019). Although Coca-Cola is a company having environmental protection and sustainable development as one of its preoccupations, it has not yet made a demand on SOSUCAM to acquire an environmental certification. Putting pressure on SOSUCAM to comply with certain norms is a step forward, but putting pressure on SOSUCAM to align to global environmental standard is more relevant for this research.

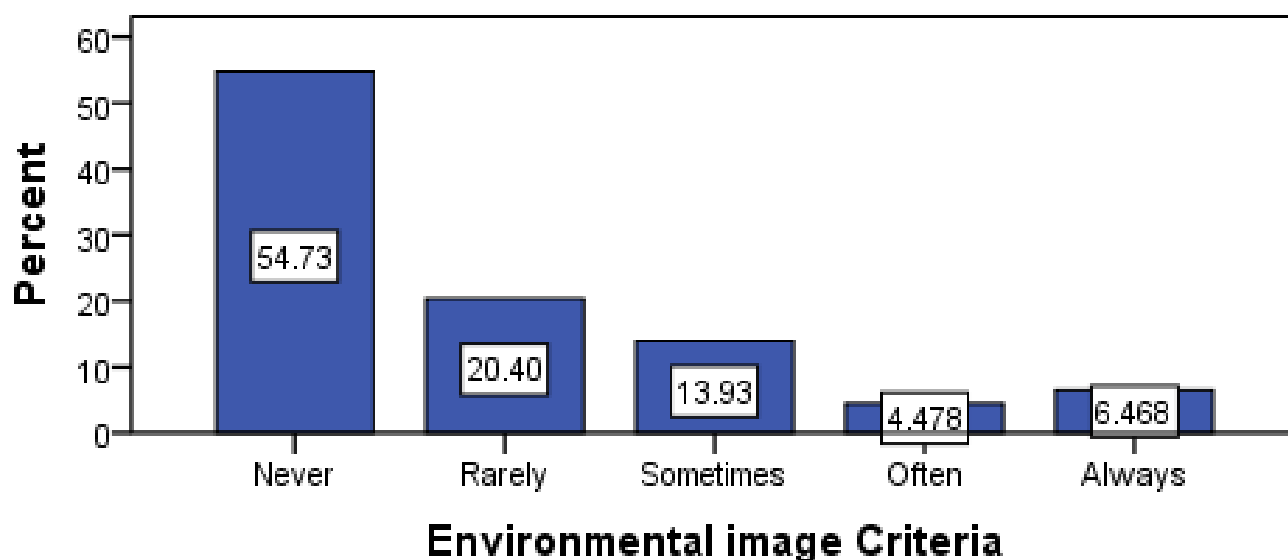


Figure 15: Level of environmental cautiousness of consumers

(Researcher, 2018)

Based on fieldwork involving the sampling of household consumers whose satisfaction constitutes one of the purposes of the enterprise's existence, the data on the diagram above was obtained. SOSUCAM's clients have the power to push SOSUCAM towards the green initiative by including the company's environmental image in their sugar selection criteria. If the majority of consumers place the environmental sustainability of a company as one of the determining factors for whether or not to consume the company's products, the company will be forced to adopt these measures.

From the diagram above we can observe that 54.73% of sugar consumers never consider the environmental image of the company before purchasing its sugar, 20.40% rarely finds, 13.93% sometimes consider, while 4.47% often considers, and 6.46% always places this consideration. From this, we can deduce that 75.13% which involves the majority of the sampled population has no or a weak consideration of the environmental image of the enterprise opposed to the minority; 10.94% who have a strong consideration for the environmental image criteria of the company. This obviously results to a very mild expectation or pressure from household consumers on SOSUCAM to fully adopt environmentally sound measures, because despite the fact that the majority of sugar consumers sampled; 97.07%, are not aware of environmental friendly measures adopted by SOSUCAM, yet SOSUCAM dominates in the Cameroonian sugar market with its household clients amounting to 71.71% as seen below.

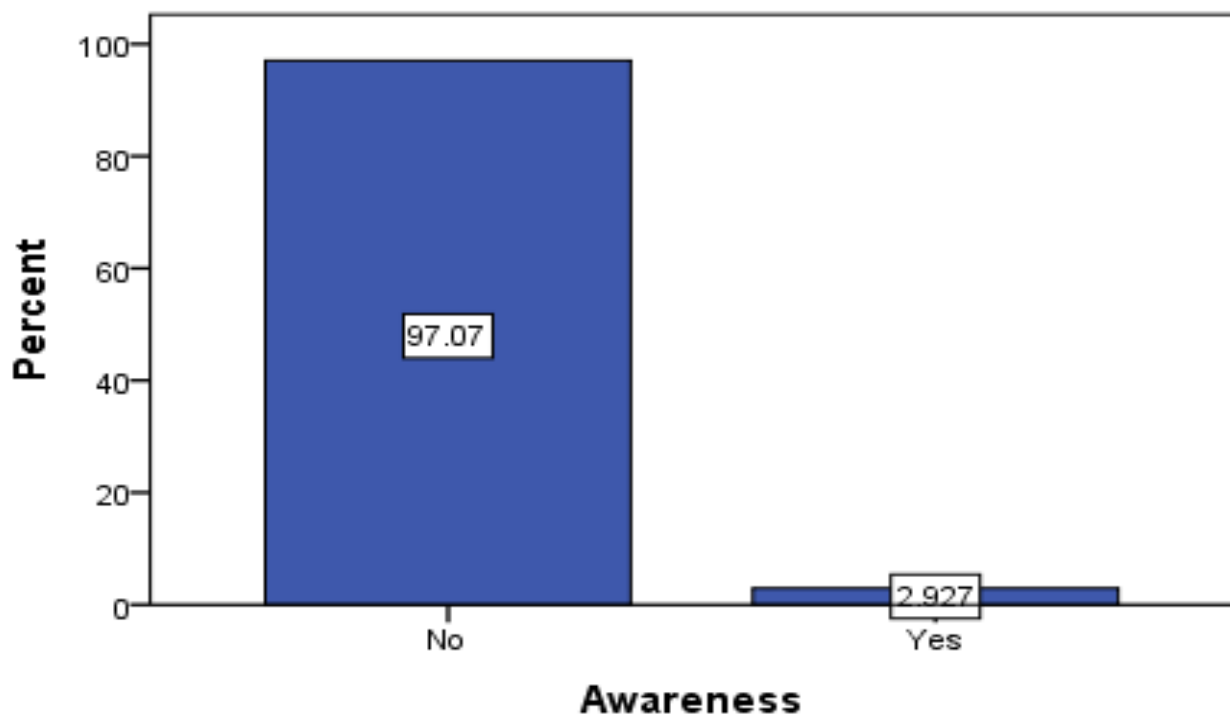


Figure 16: Customers' awareness of SOSUCAM's environmental strategies

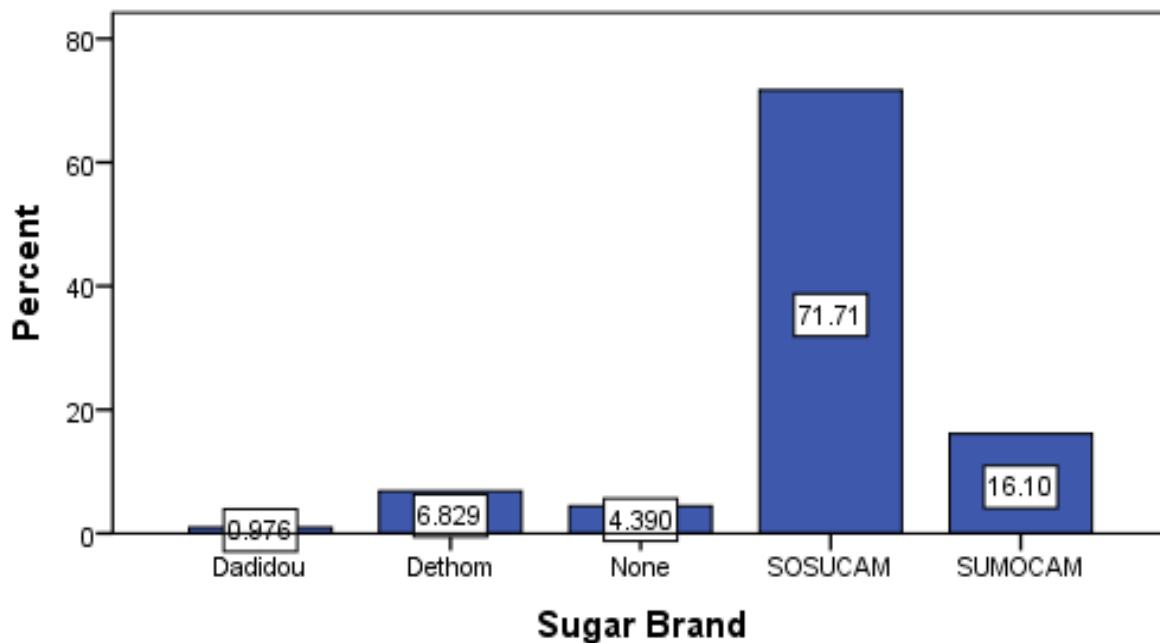


Figure 17: Consumption rate of various sugar brands

(Researcher, 2018)

Consumers rather purchase sugar based on other criteria as seen in the diagram below; 31.22% buy the sugar brand available at the time they need sugar, 2.43% purchase sugar basing themselves on the bio-nature of the sugar which will include considerations of whether chemicals or artificial substances were introduced in the sugar during the manufacturing process. On the other hand, 9.26% are just loyal to a specific brand, 3.41% buy sugar based on its nature, whereby some will prefer powder while others will prefer cubes. Others; 10.73% purchase sugar based on the color of the sugar, having in mind that brown sugar is better for the health than white sugar, while to others brown sugar is more natural than white sugar. While 9.75% purchase sugar on patriotic bases so as to promote local production; that is sugar manufactured in Cameroon. Some consumers; 4.39% are more attracted to the packaging of the sugar, while 6.82% consider the price before purchasing. 11.22% of consumers pay attention to the quality of the sugar, while 9.26% are mindful of the sucrose content of the sugar to avoid health issues such as diabetes, and we have 1.46% which doesn't consume sugar at all. These are the various criteria attached to demand in the Cameroonian sugar market, which excludes the environmental image of the company, therefore, resulting to no pressure from consumers on SOSUCAM to adopt environmentally friendly measures.

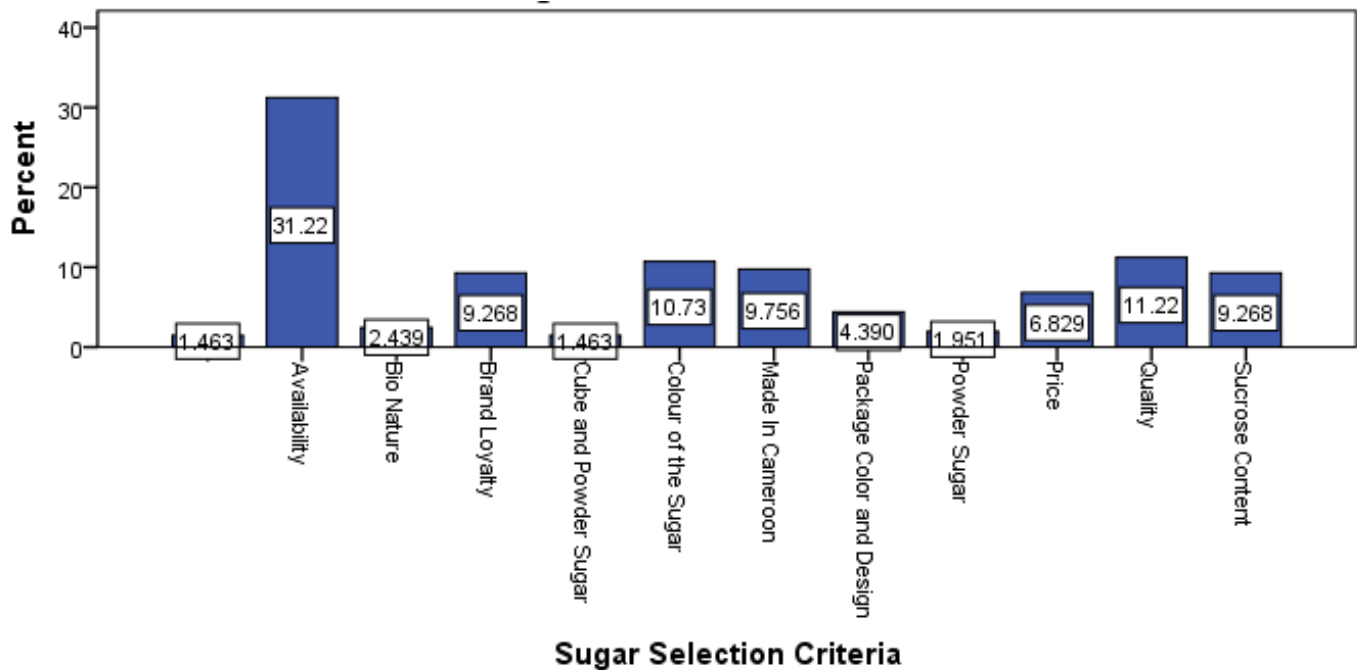


Figure 18: Customers' sugar brand selection criteria

(Researcher, 2018)

According to data gathered from the field, 72.41% of customers have the perception that the price of sugar is high and very high. The impact of this perception is the demand for a lower price on sugar by the majority of consumers. According to researches carried out by authors among which; Baresel-Bofinger et al., (2011), customers' demand for low prices is a disabling factor to GSC, because GSC practices may turn to involve slight additional cost which will be reflected on the prices of the sugar, and maybe challenging for customers to purchase with that extra cost. Based on our analysis, the customer variable can be seen as a de-enabling factor.

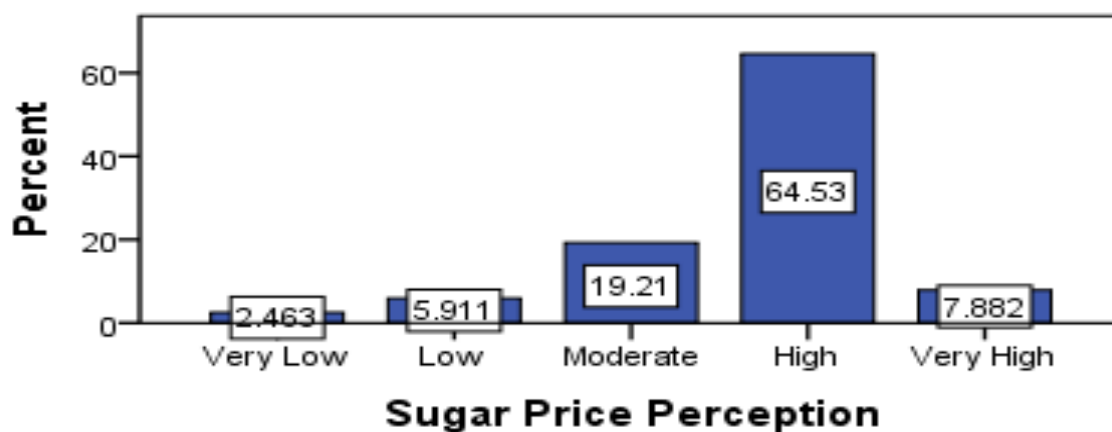


Figure 19: Customer's perception on sugar price

(Researcher, 2018)

4.2.1.1.3 External Communication

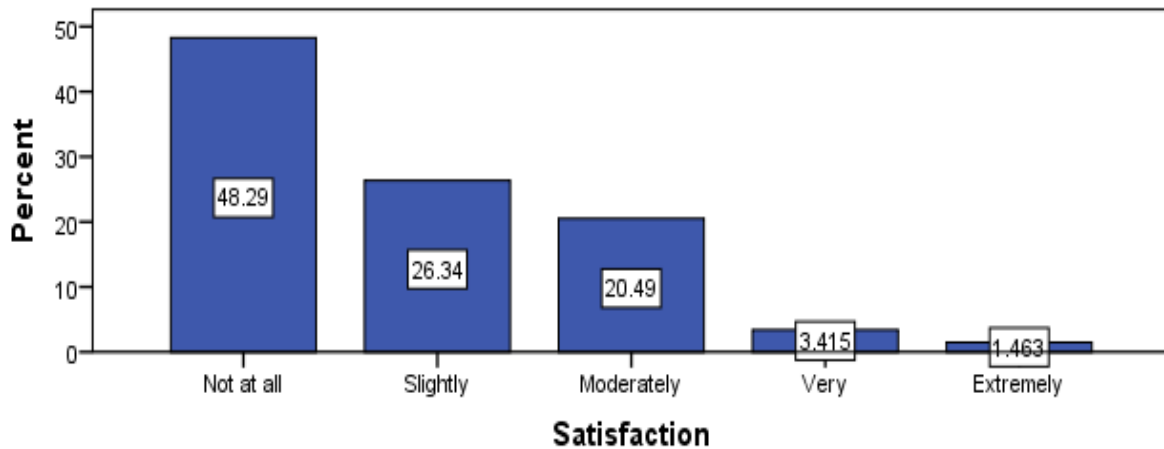


Figure 20: Customers' satisfaction level on SOSUCAM-Customers communication
(Researcher, 2018)

Based on observation and fieldwork carried out in our research, SOSUCAM does not provide adequate and satisfactory information for its consumers on their sugar package such as; the nature of the package, the nutritional fact of the sugar, and others which leaves consumers in suspense and assumptions, not really knowing the clear difference between the various sugar types, and making a better choice of which to consume.

According to the results obtained from the sampled sugar consumers, 74.63% of consumers are not at all and slightly satisfied with SOSUCAM's communication with its customers, while the minority; 4.87% are very and delighted. By deduction, SOSUCAM does not communicate enough with its customers, especially on environmental measures adopted. But if the enterprise was conscious of the fact that it has to communicate environmental measures implemented with its clients, it will be pushed to do more to present a good environmental image of the enterprise, and even use it as a strong point for its publicity. But results from fieldwork seen below shows that 97.07% of customers are not aware of the measures adopted by SOSUCAM to ensure a sustainable environment. This implies SOSUCAM does not communicate enough, although according to the commercial officer of SOSUCAM during an interview stated that SOSUCAM communicates on various platforms such as; TV, Radio, newspapers, magazines, internet and others. And equally added that to know more about the measures adopted by SOSUCAM,

customers have to get closer to the enterprise; meanwhile the enterprise has to put in place various measures to ensure consumers are adequately informed. This variable, therefore, is considered a de-enabler to GSCM in our study.

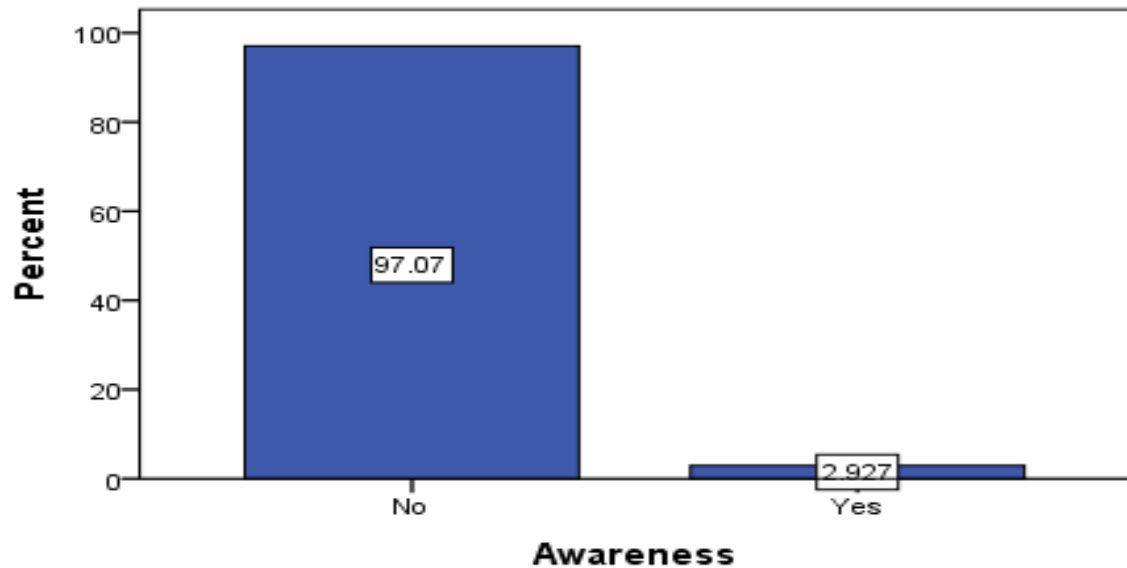


Figure 21: Customers' awareness on SOSUCAM's environmental strategies

(Researcher, 2018)

4.2.1.1.4 Competitors

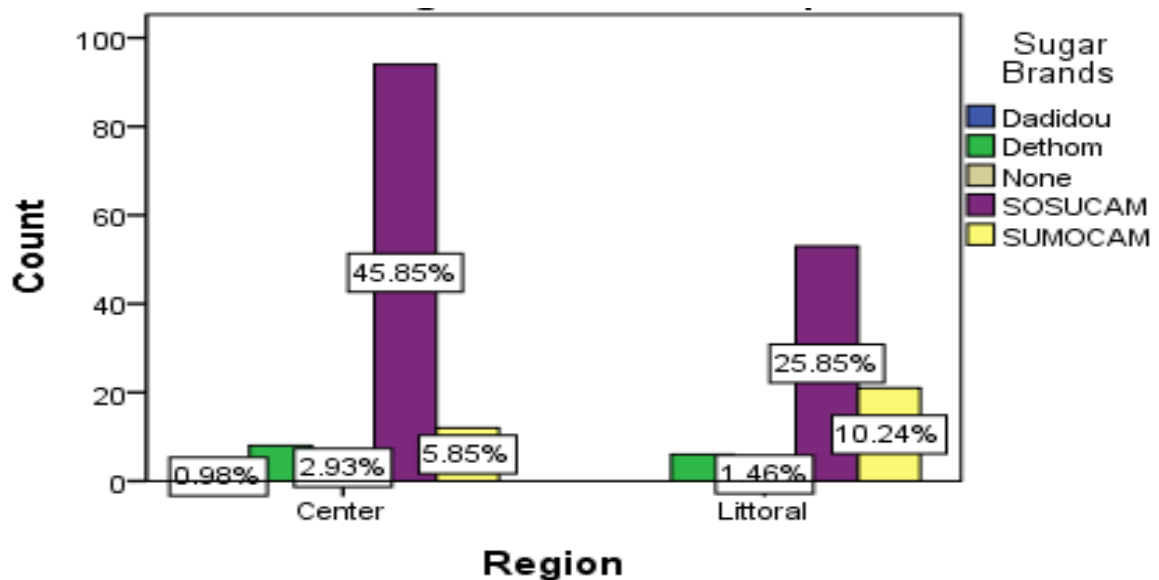


Figure 22: Consumption rate of identified sugar brands

(Researcher, 2018)

In the Cameroonian sugar market, we can find various competitive brands such as Dethom, SUMOCAM, Dadidou, Zulka and others among which SOSUCAM is the most consumed brand with 71.71% of customers as seen in the diagram above. The others are all imported sugar, which is being packaged here in Cameroon and sold. Environmental friendly measures adopted by competitors might act as a push factor on SOSUCAM to adopt and implement green practices to gain a competitive advantage in this present age where consumers are becoming more concern about their environment and health and have pushed many companies across the globe to green their supply chain.

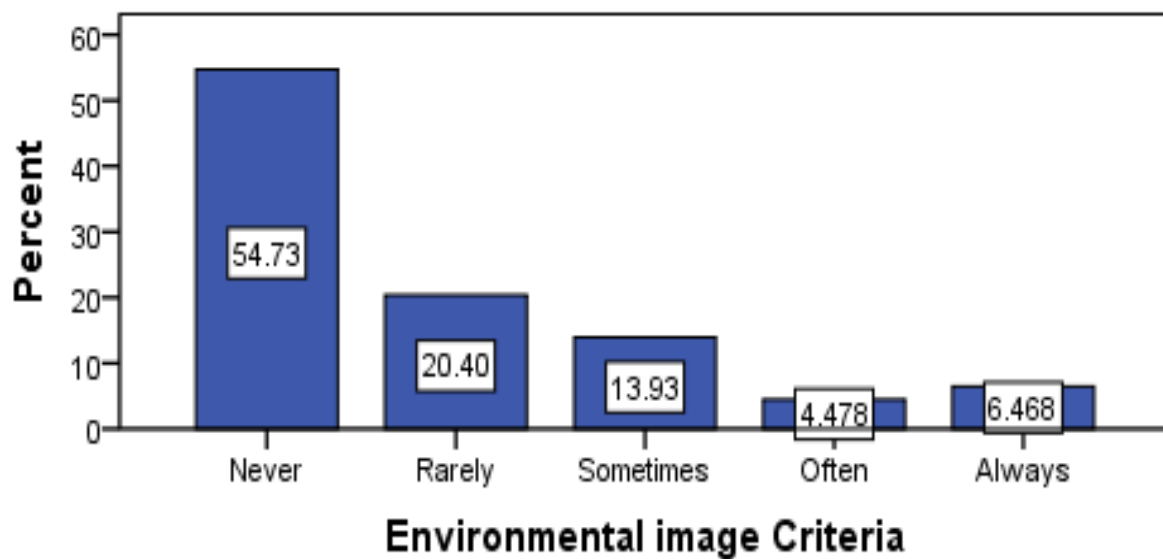


Figure 23: Customers' consideration of the environmental image of company
(Researcher, 2018)

Based on data obtained from the field as seen in figure 24 above, Cameroonians don't act like people in the western world who are conscious and eager to know the environmental image of a company before consuming its products. Competition in the Cameroonian sugar market mostly involves price and quality, as seen below. From our study, we realize that competition in the Cameroonian sugar market is not based on the environmental sustainability of the company as seen in figure 24 above where 75.13% of sugar consumers have weak consideration for an environmental image of the enterprise, while just 10.94% don't really consider the environmental image of the company.

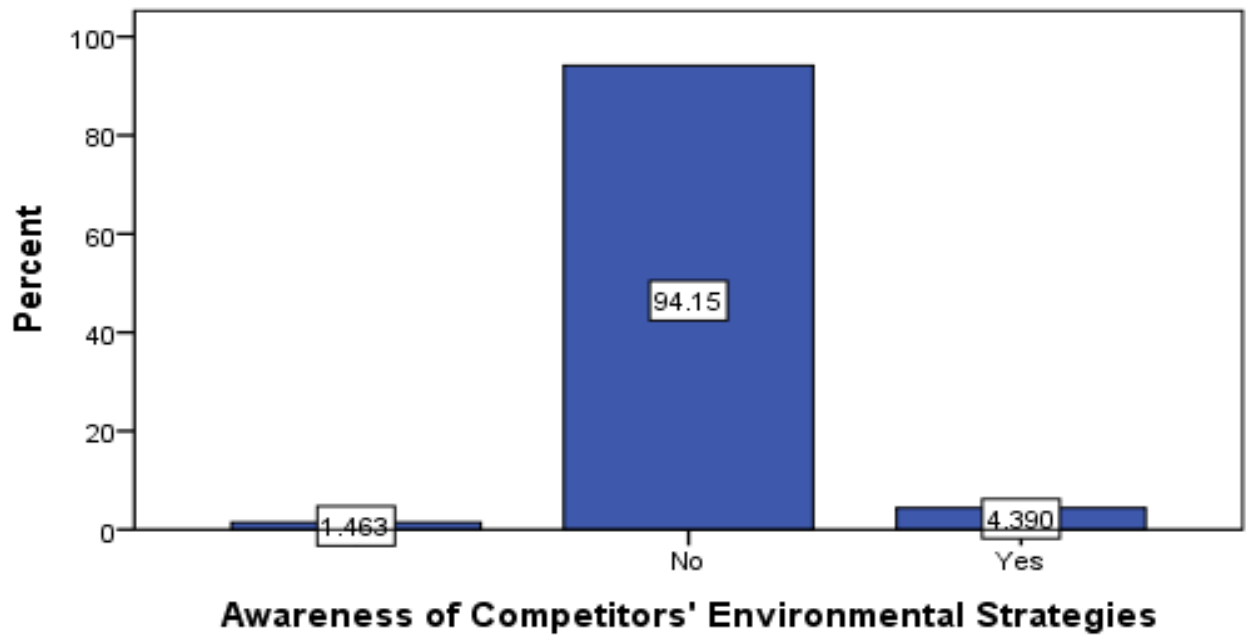


Figure 24: Customers awareness of competitors' environmental strategies
(Researcher, 2018)

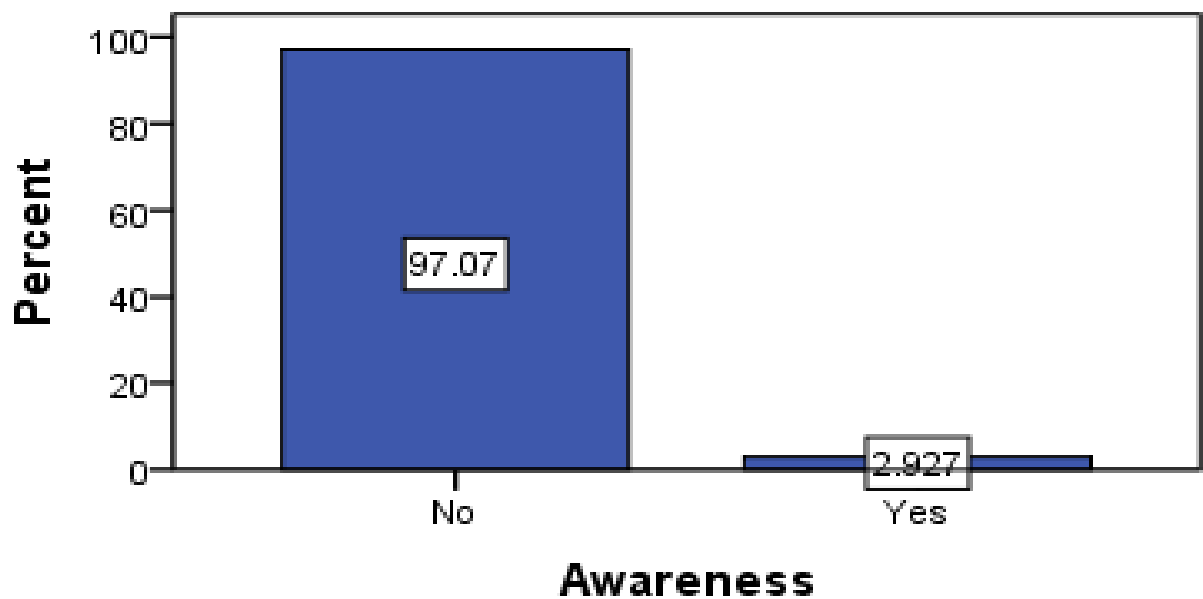


Figure 25: Customers' awareness of SOSUCAM's environmental strategies
(Researcher, 2018)

Equally, as seen in figure 26 above, 97.07% of consumers are not aware of the environmental measures adopted by SOSUCAM, and 94.15% are not aware of the rules adopted by SOSUCAM's competitors which therefore weaken the competition around environmental image of the enterprise. Competition rather is based on customer's expectations which are demonstrated in figure 27 below where customers identified their respective criteria for sugar selection which includes; availability [31.22%], bio-nature of the sugar [2.43%], brand loyalty [9.26%], nature of the sugar [1.46% & 1.95%], home production [9.75%], packaging [4.39%], price [6.82], quality, [11.22%], and the sucrose content of sugar [9.26%]. From the analysis, we can deduce that the competitor variable does not favour GSCM implementation.

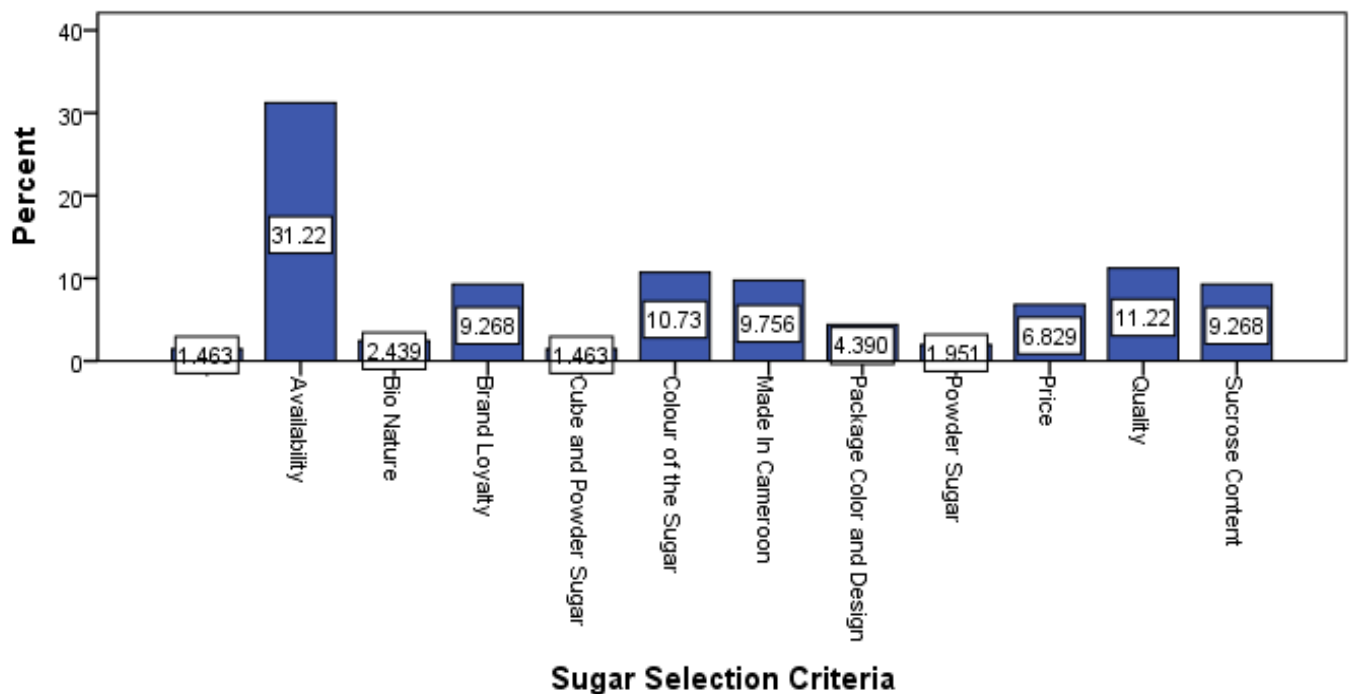


Figure 26: Customers' sugar brand selection criteria
(Researcher, 2018)

The above customer data collected in the field was collected per region, per gender, and age group. To determine whether the various variables depend on each other, we will make use of Pearson's Chi-Square for independence. We will test whether the variables are dependent or independent of age-group, gender and region.

4.2.1.1.5 Suppliers

SOSUCAM cultivates its sugarcane used in the sugar manufacturing process, but purchases its packaging from Multiprint S.A, Cameroun Continu S.A, manufactures some and imports others. SOSUCAM does not have any precise environmental criteria it places on its package supplier but rather limits itself to what the law provides. Although its plastic packages are not biodegradable, SOSUCAM ensures that its suppliers provide them with plastic packages manufactured following the legal specifications put in place by the state. This legal specifications associated with the use of plastics states that it should either be biodegradable or superior to 60 microns (Law No.004/MINEPDED/MINCOMMERCE of October 24th 2012).

Nevertheless, plastic packages are considered toxic due to the negative impacts on health and the environment associated with their utilization. Most elements used in manufacturing plastic packages are colourless, tasteless, and odourless. Such that when aliments are packaged in them, these elements melt off the plastic packages into the food unnoticed. This situation occurs, especially when exposed to heat, and this is detrimental to the human system. Bisphenol -A is one of the chemical substances found in most plastics. This substance can cause; breast cancer, low sperm count in men, chromosomal and reproductive system abnormalities, impaired brain and neurological functions, cancer, cardiovascular system damage, early puberty, obesity and resistance to chemotherapy (Achu, 2017).

Plastic packages are most often disposed of inappropriately such that they end up as litter in the environment such as streets and drainage systems. According to science, it takes between 400 to 1000 years for plastic bags to decompose (Bell & Cave, 2011). In the meantime, its presence in the ground obstructs the penetration of roots into the soil, obstructing crop growth.

Plastic packages are sometimes burned in an attempt to dispose of them, resulting in the release of toxic gases such as chlorofluorocarbon, hydro-chlorofluorocarbon, dioxins and furans. They are manufactured from petroleum byproducts such; as xylene, ethylene oxide and benzene, which causes respiratory problems and eventually cancer (Achu, 2017).

However, health is not the primary concern of the majority of customers in the selection of sugar in the Cameroonian sugar market. About 53.23% of customers sampled in the course of this study do not have or rarely have any health-related criteria in selecting which sugar to purchase or consume, about 28.36% often or always do. Due to this fact, the absence of the consideration of health criteria in the process of sugar selection is a de-enabling factor. Customers in the Cameroonian sugar market do not have the necessary motivation to exercise pressure on SOSUCAM. If it were the case, it would result in SOSUCAM exercising pressure in turn on its suppliers to provide them with environmentally friendly packaging.

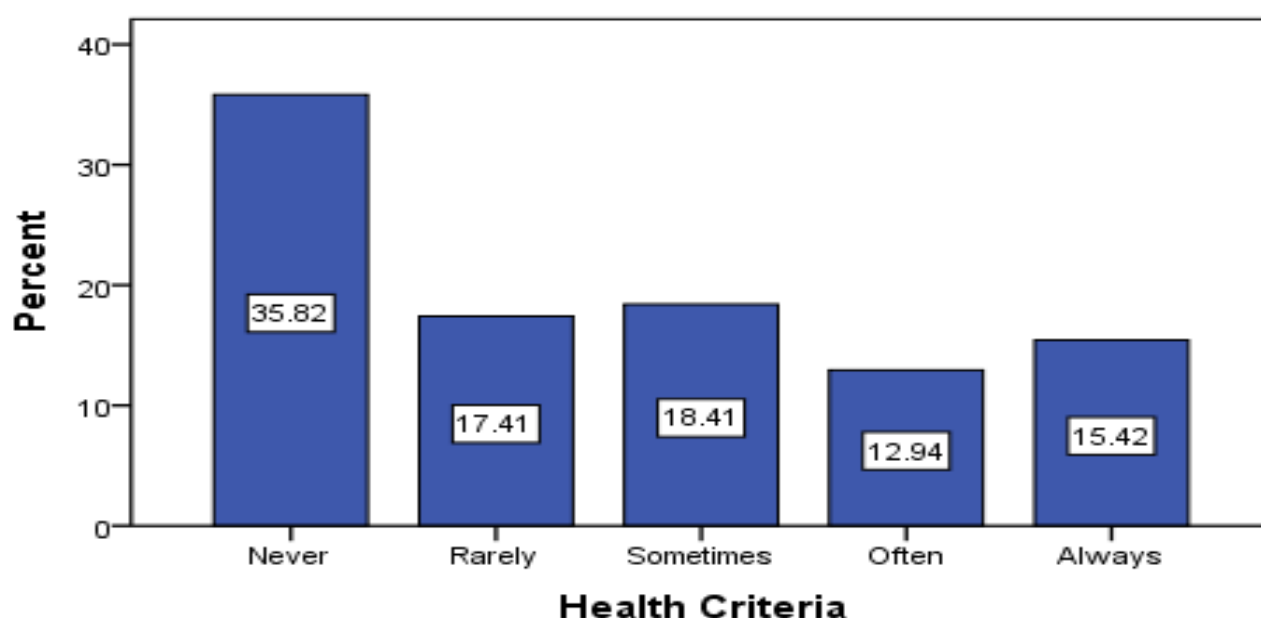


Figure 27: Customers's consideration on thier health while selecting sugar to purchase
(Researcher, 2018)

4.2.1.1.6 Legal and Institutional Framework

4.2.1.1.6.1 Legal Instruments

Mankind is in perpetual interaction with its environment within which it carries out its activities, and in order to meet up with its engagements and obligations towards environmental protection, Cameroon government has engaged international, regional and national legal instruments so as to

regulate the business environment thereby pushing industries operating within its territory such as SOSUCAM to adopt environmental-friendly measures so as to minimize the negative impacts of their activities on the environment. The international and regional instruments involve; international and regional conventions and agreements ratified by Cameroon, while the national instrument, on the other hand, involves: legal text and institutions that will all contribute towards Cameroon gaining confidence from both international investors and donors.

4.2.1.1.6.1.1 International and Regional Legal Instruments: Conventions and Agreements ratified by Cameroon

Cameroon has signed and ratified various regional and international conventions geared towards environmental protection, thus acknowledging their importance as references in relation to Cameroon's national legislation on matters relating to environmental conservation at the global and regional level. As one of the pioneer instruments on environmental protection in Africa is the "Algiers convention of September 15th 1968" which was established on October 09th 1969, which aims at ascertaining the conservation, utilization, and the development of soils, water, flora and fauna, not leaving out the future welfare of the population from an economic, nutritional, scientific, educational, cultural and aesthetic point of view. This Convention was revised in 2003 (Maputo) considering recent developments on the African environment and natural resources scene, but Cameroon is a signatory to the 1968 Convention, has not signed the revised Convention (Ruppel & Yogo, 2018).

In the same trend, the Rio Convention on Biological diversity of 1992, guided by the idea and goal of sustainable development was ratified by Cameroon and other countries across the globe. This convention establishes the relationship between ecology and economics or better still between the environment and development (Ruppel & Yogo, 2018), where development should take place in a sustainable manner such that the environment should incur little or no depletion, and therefore giving everyone the right to a healthy environment as stipulated in "Law N°96-06 of January 18th 1996 to amend the Constitution of June 2nd 1972". This convention brings out the importance of identifying, anticipating and tackling the cause of biodiversity depletion. This involves an international legally binding agreement having three primary objectives, which are:

Biodiversity preservation, sustainable use of biodiversity, the rational use of resources so as not to jeopardize consumption by the future generations.

Cameroon equally ratified "the 1992 United Nations Framework Convention on Climate Change (UNFCCC)" in 1994. This convention acknowledges the climatic system as a shared resource whose stability can be influenced by industrial emissions of Co2 as well as other green gases and therefore establishes a framework of the global intergovernmental action towards climate change.

4.2.1.1.6.1.2 National Legal Instruments

Due to the Cameroon government's preoccupation about environmental welfare, it enacted certain national laws and regulations to govern man's activities, including industrial activities within its environment to protect the environment.

Environmental Protection Laws

"Law N°96-06 of 18 January 1996 to amend the Constitution of 2 June 1972" was enacted to guarantees the right to a healthy environment by all and for all within Cameroon's territory, and the State shall ensure the protection and improvement of the environment. This implies all industries operating within Cameroon territory will carry out its activities in this perspective, making sure its activities does not deprive anyone of his right to a healthy environment. "Law N° 96-12 of 5 August 1996 relating to Environmental Management" was equally promulgated in the same year, and lays down the general framework on environmental management in Cameroon. This law equally ensures the inclusion of environmental concerns in all economic, energy, land and other plans and programmes, and also states the duties of plant and project promoters and owners regarding environmental care operating in Cameroon. This law also ensures the protection of the atmosphere, soils, subsoil, continental waters, flood plains, coast and maritime waters from pollution such as industrial pollution, and provides some anticipated sanctions linked to the nonconformance to the established environmental norms.

On the 23rd of August 2011 another decree was signed to establish the methods of protection of soils and the subsoil, and states in its article 3 that all activities associated with the exploitation

of soils should be carried out in such a way that will limit or eliminate soil erosion and desertification (Decree N° 2011/2584/PM of 23 August 2011). It goes further to list some prohibited substances, considered dangerous, and regulates their disposal into continental waters and specifies that this list can be complemented with that from international and regional conventions ratified by Cameroon (Decree N° 2011/2585/PM of 23 August 2011).

Measures regarding waste management were equally stated, by the "Decree No 2012/2809/PM of September 26th 2012 establishing the criteria for selection, collection, storage, transportation, recovery, recycling, treatment and final elimination of waste", recommending a sustainable waste treatment. In its article 9, it states that the collection, transportation, and storage of industrial waste should be subject to an environmental licence obtained from the competent authority in charge of the environment. While article 10 states that the transportation or movement of these industrial wastes should be accompanied by a proclamation of traceability of waste delivered by the competent authority in charge of the environment. In addition, "Decree N° 002/MINEPDED of October 15th 2012 to establish specific conditions for the management of industrial waste", mentions in its article 3 that all operators of any plant generating more than 2 tonnes of hazardous industrial waste has to present a waste disposal plan to the competent administration in charge of the environment.

Decree N° 004/MINEPDED/MINCOMMERCE of October 24th 2012, relating to the manufacturing, importation and the commercialization of non-biodegradable packages restricts traders from engaging into certain activities which could have some harmful impacts on the environment. Among these prohibited activities we find in article 7 paragraph 1, the prohibition of the manufacturing, importation, commercialization or distribution of plastic packages inferior to 61 microns (where 1 micron is equivalent to 1/1,000 mm).

4.2.1.1.6.2 Institutional Framework

To see to it that the enacted laws are respected within the Cameroonian territory, the state established some institutions such as ministries, committees, etc. Cameroon's legal domain, therefore, involves both laws and institutions put in place to ascertain the protection and conservation of the environment.

According to Ruppel & Yogo, (2018), the "inter-ministerial committee on the environment" was created under law N°96/12 of August 05th 1996 relating to environmental management and was attributed the duty of assisting the government in planning, coordinating, monitoring and controlling national environmental and sustainable development policies. This committee equally has as duty among many to;

- Ensure that environmental considerations are taken during the conception and execution of economic, energetic plans and programs.
- Coordinate and orientate the execution of the state's environmental plan of action.
- Support the state in the prevention and management of urgent issues which could be a treat to the environment, or result in environmental degradation.

The government unit placed directly over environmental management is the Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) which is in charge of ensuring the implementation of government policies regarding the environment, and the protection of nature towards the achievement of sustainable development. This ministry equally takes part in the negotiations for international and regional conventions and agreements linked to environmental protection.

There equally are other technical units such as; ANOR, which is a public administrative unit, created in September 2009 under the technical supervision of the MINMIDT and the financial oversight of the Ministry of Finance (MINFI), and have been endowed with financial autonomy and legal entity (ANOR, 2017), and assist in the governmental action towards environmental management (Ruppel & Yogo, 2018). ANOR has the mission to contribute to the elaboration and execution of the governmental policy in the domain of quality control and standardization in Cameroon (ANOR, 2017). It elaborates and approves standards, certifies standard compliance, promotes standards and quality with public, semipublic and private institutions, and propose ways to improve the quality of goods and services. Environmental protection standards are equally included in the national standardization system (Ruppel & Yogo, 2018).

SOSUCAM also receives pressure from NGOs, and the last one experienced was more inclined towards Human resource and resource management. After an audit, the NGOs realized that the

issues enunciated had already been solved by the company (Communication officer of SOSUCAM, Personal Communication, February 21, 2019).

4.2.1.2 Internal variable

4.2.1.2.1 Interdepartmental communication

According to an employee of the company, collaboration and communication between various departments exist in SOSUCAM without which production will be impossible. SOSUCAM's activities are interwoven and follow a sequential order. This sequence involves multiple departments and tasks which cannot be carried out simultaneously and will only commence after the execution of the previous one. For the successful execution of these tasks, a proper synergy has been established between various departments. In the course of the research, it was observed that; the communication existing within the enterprise was to an extent. This conclusion was based on the observation that; workers were unable to respond to obvious questions concerning the enterprise so long as it was not directly related to their field of expertise. Questions pertaining to environmental management measures implemented by SOSUCAM could not be addressed by most workers as they were not informed, whereas, for a company preoccupied with environmental wellness, ecological management is a subject that will flow across the company as it will implicate employees from various departments of the enterprise whose contributions are important for it to be successfully carried out. According to the communication officer of SOSUCAM (Personal communication, February 21, 2019), the enterprise organizes sessions of training and development such that in 2018, it devoted 30 000hours for training and development. The issues or topics handled during this training sessions are determined per department by the head of the various departments depending on the needs he/she identifies, but an anonymous employee from the production unit during an interview highlighted that environmental preservation and sustainable development methods had not been covered in their training sessions.

4.2.1.2.2 Internal stakeholders

From observation in the course of our research, it was realized that most workers had little or no knowledge on; sustainable development, environmental management, and environmental-friendly practices within SOSUCAM. Environmental management responsibility in SOSUCAM has been entirely placed under the care of the QSED, such that the workers from other department do not feel concerned, and will therefore manifest little or no engagement towards the greening process since they believe it is the duty of the QSED department. Various managers too have not really shown engagement in the greening process, because according to anonymous employees interviewed, topics related to sustainable development and environmental care have not been raised in the course of their training and development or capacity building sessions. Nevertheless, there are experts in the domain of sustainable development and environmental management working under the QSED department. Some environmental-friendly practices have been implemented over time at various levels of the enterprise's SC such as; at the level of their agricultural process, production, etc. which shows the management's commitment in implementing environmental practices. Judging from all the environmental-friendly measures adopted by SOSUCAM such as the use of bagasse to produce electrical energy and fertilizer, and the commercialization of part of its waste products, green measures are perceived and incorporated by management as a strategy towards cost minimization and profit maximization. Management, therefore, considers green measures as a vital aspect of SOSUCAM towards achieving efficiency.

4.2.1.2.3 Organizational Strategy

Environmental wellness falls within SOSUCAM's organizational strategy since it has invested a lot in environmental-friendly practices, which enables it to minimize its cost and maximize its profit. Green practices fall within SOSUCAM's cost reduction strategy, where it saves finances which would have been spent subscribing to ENEO for electricity and spends less by making use of the waste substances generated in the course of its production, for the production of its electrical power.

SOSUCAM is equally engaged in a Capacity-building or training and development process of its employees wherein 2018, 30 000 hours were reserved for that purpose. After this capacity building process, an evaluation of performance is carried out to determine how practical the training was. The themes of the training programs are selected depending on the need or urgency at each specific period. If a loophole is identified in any service, the person in charge of that service can signal, a trainer is identified for that purpose, and from there a training session can kick off so as to close that hole. These training sessions are carried out in partnership with institutions, organizations and experts, where workers can be sponsored to go and study in a specific institution or the trainer displaced to come and train in the company.

Although conscious of the image or reputation accompanied with it, environmental-friendly practices are not really considered by the enterprise as a tool to gain a competitive advantage in the sugar market because it is not really been used for the publicity of the enterprise, and hitherto the enterprise has not yet obtained an environmental certification. Green measures are rather considered by management as a strategy towards achieving efficiency where according to the communication and production officer of SOSUCAM, waste products obtained from the production process are being partly commercialized to enterprises that use them as raw material which generates extra revenue to SOSUCAM, while part of it is being reused by SOSUCAM which lead to a reduction of materials to be purchased.

Corporate social responsibility (CSR), which contributes to SD is not really far from environmental measures and equally falls within SOSUCAM's organizational strategy. SOSUCAM carries this out through the provision of assistance to the surrounding community in the form of donation of agricultural tools and other tools like grinding machines, organizing workshops, capacity building sessions which enable the community to acquire more skills in the domain of agriculture (Communication officer of SOSUCAM, February 21, 2019). SOSUCAM proceeded with the creation of a college, and two nursery and primary schools so as to enable the local population to have access to education, and has also taken the engagement to take charge of 17 school teachers from the community. SOSUCAM also assist the local population in transportation by providing bus shuttle services. The shuttles are such that both the workers and the local community benefit free of charges (SOMDIAA, 2018).

4.2.1.2.4 Financial Resources

As mentioned in our literature review, SOSUCAM realizes an annual pretax turnover of about 60 billion FCFA and can be considered a large enterprise, which therefore has more liquidity than small and medium-size enterprises which realizes less. Moreover, SOSUCAM was established with a capital of CFA 13,925,000,000 and Arsene, (2017) stated SOSUCAM to be worth 27,531,110,000 FCFA; The higher the liquidity of an enterprise the greater its ability to invest into major projects and innovations, including environmentally sustainable projects.

4.2.1.2.5 Company Size

According to chapter 1, section 5 and 6 of "Law No. 2010/001 of 13 April 2010", a small-sized enterprise is one that has between 6 to 20 employees, and an annual pre-tax turnover of more than 15million CFA francs and less than 100million CFA francs. While a medium-sized enterprise is one that has a range of 21 to 100 employees and an annual pre-tax turnover of more than 100 million CFA francs, but less than 1billion CFA francs. This implies that the larger the enterprise, the more employees it recruits, and the higher its annual pre-tax turnover. SOSUCAM, which has over 8000 employees and a yearly pretax turnover of about 60 Billion FCFA as seen in our literature review, can be considered a large enterprise. It is but obvious that it is easier for a larger enterprise to carry out major projects or endeavours than it is for smaller enterprises due to its pool of expertise and its liquidity level. According to Kerstin & Joanne, (2016), from a resource-based perspective, larger organizations are most likely to adopt GSCM due to the availability of human and financial resources at their disposition, because implementing GSCM is financially demanding, and also highly demanding on human resources which is usually a challenge in small enterprises.

4.2.1.2.6 Technology

During an interview with the communication officer of SOSUCAM, it was recorded that SOSUCAM is open to technological evolution and innovation. As part of technological innovation, SOSUCAM has proceeded in the mechanization of the sugar cane cultivation process which over the years has not been taking a look at the harvest where 260 000 tons of sugarcane

was harvested mechanically against 1 100 000 tons harvested manually in the same period. The cultivation done by SOSUCAM is done with the use of GPS and controlled at the level of computers by experts such as engineers in agriculture, topography, mechanics, industry, etc. There equally is the irrigation project which came up due to poor yield resulting from climate change, which is a huge investment which involved a lot of resources such as financial, material and human resources. The climate change which is sometimes accompanied with harsh dry seasons which turn to affect the soil and lead to the drying off of some portions of the plantations as seen in the picture below contrary to the greener portion which is taken care of by irrigation.



Figure 28: SOSUCAM's irrigation project
(SOSUCAM, 2018)

The machine seen in figure 29 above is used in watering SOSUCAM's sugarcane plantation and is controlled with the use of a GPS such that it can be displaced over hectares of land watering the plantation especially during dry seasons. SOSUCAM has embraced evolution by making use of bagasse as a natural fertilizer and has stopped the use of chemical fertilizers in its plantations.

Sugar cane is one of those plants which have a full cycle, and a wide range of uses, such that at each level of production, the remains or waste are being collected, and used for further purposes and production. Treacle obtained in the production process is equally used for road maintenance, especially in the dry season so as to avoid dust but was stopped due to the inconveniences it caused such as the deformation of the road. Bagasse is used by SOSUCAM to produce its electrical energy which is used by the company mills, offices, lodgings and hospitals, such that they do not use electricity from ENEO, and equally, don't use water from Camwater and "La Camerounaise des Eaux", they instead derive their own water (Communication officer of SOSUCAM, Personal communication, February 21, 2019). We can, therefore, see the innovative spirit reigning in the company, and its willingness to acquire modern technology and knowledge which will enable it carry out its activities successfully and also facilitate the implementation of GSCM practices.

The Chi-square test for independence

We will make use of the chi-square to test for the independence of the collected data.

Gender

Table 6: Satisfied with SOSUCAM-Customer Communication * Gender

			Satisfied with SOSUCAM-Customer Communication					Total
			Not at all	Slightly	Moderately	Very	Extremely	
Gender	Female	Count	37	27	24	5	1	94
		Expected Count	45.4	24.8	19.3	3.2	1.4	94.0
	Male	Count	62	27	18	2	2	111
		Expected Count	53.6	29.2	22.7	3.8	1.6	111.0
Total	Count		99	54	42	7	3	205
	Expected Count		99.0	54.0	42.0	7.0	3.0	205.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.431 ^a	4	.115
Likelihood Ratio	7.499	4	.112
N of Valid Cases	205		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.38.

A chi-square test for independence was conducted analyzing whether gender and customer satisfaction with SOSUCAM to customer communication are dependent or independent of each other. The research hypothesis is; customer satisfaction with SOSUCAM to customer communication is dependent of gender, while the null hypothesis is that customer satisfaction with SOSUCAM to customer communication is not dependent of gender.

H_1 = Customer satisfaction with SOSUCAM to customer communication is dependent on gender

H_0 = Customer satisfaction with SOSUCAM to customer communication is not dependent on gender

The assumptions necessary for a chi-square analysis to be made was not met due to the fact that the expected count in 4 cells (40%) are less than 5 which is way bigger than 20%, the Likelihood Ratio is therefore used as the statistical significance value (.112), which is greater than the chosen significance level/alpha error rate ($\alpha = .05$). Leading to the acceptance of the null hypothesis and reject the research hypothesis establishing that customer satisfaction with SOSUCAM-customer communication is not dependent on gender.

Table 7: Gender * Sugar Price Perception

		Sugar Price Perception					Total	
		Very Low	Low	Moderate	High	Very High		
Gender	Female	Count	0	6	19	62	7	94
		Expected Count	2.3	5.6	18.1	60.7	7.4	94.0
	Male	Count	5	6	20	69	9	109
		Expected Count	2.7	6.4	20.9	70.3	8.6	109.0
Total		Count	5	12	39	131	16	203
		Expected Count	5.0	12.0	39.0	131.0	16.0	203.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.566 ^a	4	.335
Likelihood Ratio	6.473	4	.167
N of Valid Cases	203		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.32.

H_1 = Sugar price perception of customers is dependent on gender

H_0 = Sugar price perception of customers is not dependent on gender

According the results obtained from Pearson's chi-square test of independence conducted to analyze if gender and customer's perception of the price of sugar are dependent or independent of each other, the null hypothesis failed to be rejected since the P-value (.335) is significantly greater than the chosen significance level ($\alpha = .05$). It is therefore concluded that sugar price perception of customers is therefore not dependent of gender.

Table 8: Gender * Environmental Consciousness

			Environmental Consciousness					Total
			Never	Rarely	Sometimes	Often	Always	
Gender	Female	Count	50	19	16	1	8	94
		Expected Count	51.4	19.2	13.1	4.2	6.1	94.0
	Male	Count	60	22	12	8	5	107
		Expected Count	58.6	21.8	14.9	4.8	6.9	107.0
Total		Count	110	41	28	9	13	201
		Expected Count	110.0	41.0	28.0	9.0	13.0	201.0

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.025 ^a	4	.135
Likelihood Ratio	7.758	4	.101
N of Valid Cases	201		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 4.21.

H_1 = Environmental consciousness of customers is dependent of gender

H_0 = Environmental consciousness of customers is not dependent of gender

The results obtained from Pearson's chi-square test of independence conducted analyze if environmental consciousness of customers is associated to gender or not resulted to a P-value of .135, which is greater than the chosen significance level ($\alpha = .05$), leading to the acceptance of the null hypothesis and rejection of the research hypothesis. Leading to the conclusion that environmental consciousness of customers is not associated to gender.

Table 9: Gender * Health Criteria

			Health Criteria					Total
			Never	Rarely	Sometimes	Often	Always	
Gender	Female	Count	34	13	20	12	15	94
		Expected Count	33.7	16.4	17.3	12.2	14.5	94.0
	Male	Count	38	22	17	14	16	107
		Expected Count	38.3	18.6	19.7	13.8	16.5	107.0
Total		Count	72	35	37	26	31	201
		Expected Count	72.0	35.0	37.0	26.0	31.0	201.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.134 ^a	4	.711
Likelihood Ratio	2.151	4	.708
N of Valid Cases	201		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.16.

H_1 = Health consciousness of customers is dependent of gender

H_0 = Health consciousness of customers is not dependent of gender

After running a Pearson's chi-square test of independence to analyze if the health consciousness of customers is dependent of gender or not, a P-value of .711 was obtained, which is significantly greater than the chosen significance level ($\alpha = .05$), leading to the acceptance of the null hypothesis and rejection of the research hypothesis. This leads to the conclusion that the health consciousness of customers is not dependent of gender.

Region

Table 10: Region of Residence * Health Criteria

			Health Criteria					Total
			Never	Rarely	Sometimes	Often	Always	
Region of Residence	Center	Count	39	21	20	16	24	120
		Expected Count	43.0	20.9	22.1	15.5	18.5	120.0
	Littoral	Count	33	14	17	10	7	81
		Expected Count	29.0	14.1	14.9	10.5	12.5	81.0
	Total	Count	72	35	37	26	31	201
		Expected Count	72.0	35.0	37.0	26.0	31.0	201.0

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.490 ^a	4	.241
Likelihood Ratio	5.793	4	.215
N of Valid Cases	201		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.48.

H_1 = Health consciousness of customers is associated to their location

H_0 = Health consciousness of customers is not associated to their location

From the chi-square analysis conducted to test whether there is an association between the location of customers and their health consciousness or not, we obtained a P-value of .241 which is greater than the chosen significance level ($\alpha = .05$). We therefore do not reject the null hypothesis and draw the conclusion that there is not enough evidence to suggest an association between the health consciousness of customers and their location.

Table 11: Region of Residence * Environmental Consciousness

			Environmental Consciousness					Total
			Never	Rarely	Sometimes	Often	Always	
Region of Residence	Center	Count	60	24	22	4	9	119
		Expected Count	65.1	24.3	16.6	5.3	7.7	119.0
	Littoral	Count	50	17	6	5	4	82
		Expected Count	44.9	16.7	11.4	3.7	5.3	82.0
	Total	Count	110	41	28	9	13	201
		Expected Count	110.0	41.0	28.0	9.0	13.0	201.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.697 ^a	4	.153
Likelihood Ratio	7.066	4	.132
N of Valid Cases	201		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 3.67.

H_1 = Environmental consciousness of customers is dependent of their location

H_0 = Environmental consciousness of customers is independent of their location

The chi-square was carried out to analyze whether environmental consciousness of customers is dependent of their location or not. Due to the fact that the p-value obtained (.153) is greater than the selected significance level ($\alpha = .05$), we fail to reject the null hypothesis and therefore conclude that environmental consciousness of customers is independent of their location.

Table 12: Region of Residence * Sugar Price Perception

			Sugar Price Perception					Total
			Very Low	Low	Moderate	High	Very High	
Region of Residence	Center	Count	3	3	19	84	12	121
		Expected Count	3.0	7.2	23.2	78.1	9.5	121.0
	Littoral	Count	2	9	20	47	4	82
		Expected Count	2.0	4.8	15.8	52.9	6.5	82.0
	Total	Count	5	12	39	131	16	203
		Expected Count	5.0	12.0	39.0	131.0	16.0	203.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.574 ^a	4	.032
Likelihood Ratio	10.607	4	.031
N of Valid Cases	203		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 2.02.

H_1 = Customer's perception of the price of sugar is dependent of their location

H_0 = Customer's perception of the price of sugar is independent of their location

After performing a Pearson's chi-square test of independence to analyze whether = customer's perception of the price of sugar is dependent of their location or not, the assumption required was not met since there are 3 cells (30.0%) with expected count less than 5 which is greater than 20%. We therefore make use of the "likelihood ratio" to obtain our p-value (.031) which is lesser than our selected significance level ($\alpha = .05$), leading to the rejection of the null hypothesis and conclusion that customer's perception of the price of sugar is dependent of their location.

Table 13: Region of Residence * Satisfied with SOSUCAM-Customer Communication

			Satisfied with SOSUCAM-Customer Communication					Total
			Not at all	Slightly	Moderately	Very	Extremely	
Region of Residence	Center	Count	57	34	23	5	3	122
		Expected Count	58.9	32.1	25.0	4.2	1.8	122.0
	Littoral	Count	42	20	19	2	0	83
		Expected Count	40.1	21.9	17.0	2.8	1.2	83.0
	Total	Count	99	54	42	7	3	205
		Expected Count	99.0	54.0	42.0	7.0	3.0	205.0

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.268 ^a	4	.514
Likelihood Ratio	4.357	4	.360
N of Valid Cases	205		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.21.

H_1 = Customer's Satisfaction with SOSUCAM-customer communication is dependent of their location

H_0 = Customer's Satisfaction with SOSUCAM-customer communication is independent of their location

From the chi-square conducted the assumption was not met since 4 cells (40.0%) have expected count less than 5, which is greater than 20% which is the minimum. The p-value is therefore gotten from the "likelihood ratio" (.360) which is greater than the significance level selected ($\alpha = .05$), leading to the rejection of the research hypothesis and conclusion that customer's satisfaction with SOSUCAM-customer communication is independent of their location.

Age group

Table 14: Age Group * Satisfied with SOSUCAM-Customer Communication

			Satisfied with SOSUCAM-Customer Communication					Total
			Not at all	Slightly	Moderately	Very	Extremely	
Age Group	18-25	Count	15	11	12	2	2	42
		Expected Count	20.3	11.1	8.6	1.4	.6	42.0
	26-35	Count	58	34	21	5	1	119
		Expected Count	57.5	31.3	24.4	4.1	1.7	119.0
	36-45	Count	18	7	9	0	0	34
		Expected Count	16.4	9.0	7.0	1.2	.5	34.0
	46-55	Count	2	1	0	0	0	3
		Expected Count	1.4	.8	.6	.1	.0	3.0
	55+	Count	6	1	0	0	0	7
		Expected Count	3.4	1.8	1.4	.2	.1	7.0
Total	Count		99	54	42	7	3	205
	Expected Count		99.0	54.0	42.0	7.0	3.0	205.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.342 ^a	16	.500
Likelihood Ratio	18.035	16	.322
N of Valid Cases	205		

a. 16 cells (64.0%) have expected count less than 5.

The minimum expected count is .04.

H_1 = Customer's Satisfaction with SOSUCAM-customer communication is associated to their age group

H_0 = Customer's Satisfaction with SOSUCAM-customer communication is not associated to their age group

The chi-square test for independence was carried out to analyze whether Customer's satisfaction with SOSUCAM-customer communication is associated to their age group or not. The

assumption required for a chi-square test was not met since 16 cells (64.0%) have expected count less than 5, with minimum being 20%. In this case the “likelihood ratio” was used to obtain the p-value (.322) which is greater than the significance level selected ($\alpha = .05$). We thereby accept the null hypothesis concluding that customer’s satisfaction with SOSUCAM-customer communication is not associated to their age group.

Table 15: Age Group * Sugar Price Perception

			Sugar Price Perception					Total
			Very Low	Low	Moderate	High	Very High	
Age Group	18-25	Count	3	8	11	20	0	42
		Expected Count	1.0	2.5	8.1	27.1	3.3	42.0
	26-35	Count	1	4	24	80	10	119
		Expected Count	2.9	7.0	22.9	76.8	9.4	119.0
	36-45	Count	1	0	3	23	6	33
		Expected Count	.8	2.0	6.3	21.3	2.6	33.0
	46-55	Count	0	0	0	3	0	3
		Expected Count	.1	.2	.6	1.9	.2	3.0
	55+	Count	0	0	1	5	0	6
		Expected Count	.1	.4	1.2	3.9	.5	6.0
	Total	Count	5	12	39	131	16	203
		Expected Count	5.0	12.0	39.0	131.0	16.0	203.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.349 ^a	16	.003
Likelihood Ratio	37.659	16	.002
N of Valid Cases	203		

a. 17 cells (68.0%) have expected count less than 5. The minimum expected count is .07.

H_1 = Customer’s perception of the price of sugar is dependent of their age group

H_0 = Customer’s perception of the price of sugar is independent of their age group

The assumption required for the chi-square test was violated since 17 cells (68.0%) have expected count less than 5. The p-value is therefore obtained from the “likelihood ratio” (.002), which is smaller than the significance level selected ($\alpha = .05$), leading to the rejection of the null hypothesis. Customer’s perception of the price of sugar is therefore dependent of their age group.

Table 16: Age Group * Environmental Consciousness

		Environmental Consciousness					Total
		Never	Rarely	Sometimes	Often	Always	
Age Group	18-25 Count	21	6	8	4	3	42
	18-25 Expected Count	23.0	8.6	5.9	1.9	2.7	42.0
	26-35 Count	63	29	15	4	7	118
	26-35 Expected Count	64.6	24.1	16.4	5.3	7.6	118.0
	36-45 Count	20	4	5	1	3	33
	36-45 Expected Count	18.1	6.7	4.6	1.5	2.1	33.0
	46-55 Count	2	1	0	0	0	3
	46-55 Expected Count	1.6	.6	.4	.1	.2	3.0
	55+ Count	4	1	0	0	0	5
	55+ Expected Count	2.7	1.0	.7	.2	.3	5.0
	Total Count	110	41	28	9	13	201
	Total Expected Count	110.0	41.0	28.0	9.0	13.0	201.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.443 ^a	16	.843
Likelihood Ratio	11.872	16	.753
N of Valid Cases	201		

a. 15 cells (60.0%) have expected count less than 5. The minimum expected count is .13.

H_1 = Environmental consciousness of customers is associated to their age group

H_0 = Environmental consciousness of customers is not associated to their age group

According the results obtained from Pearson's chi-square test of independence conducted to analyze if the environmental consciousness of customers is associated to their age group or not, the P-value (.753) is significantly greater than the selected significance level ($\alpha = .05$). This leads to the non-rejection of the null hypothesis and establishes a serious association between the environmental consciousness of customers and their age group.

Table 17: Age Group * Health Criteria

		Health Criteria					Total
		Never	Rarely	Sometimes	Often	Always	
Age Group	18-25 Count	17	5	6	5	9	42
	Expected Count	15.0	7.3	7.7	5.4	6.5	42.0
	26-35 Count	41	24	21	16	17	119
	Expected Count	42.6	20.7	21.9	15.4	18.4	119.0
	36-45 Count	13	4	8	4	3	32
	Expected Count	11.5	5.6	5.9	4.1	4.9	32.0
	46-55 Count	1	1	0	0	1	3
	Expected Count	1.1	.5	.6	.4	.5	3.0
	55+ Count	0	1	2	1	1	5
	Expected Count	1.8	.9	.9	.6	.8	5.0
	Total Count	72	35	37	26	31	201
	Expected Count	72.0	35.0	37.0	26.0	31.0	201.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.645 ^a	16	.831
Likelihood Ratio	12.845	16	.684
N of Valid Cases	201		

a. 12 cells (48.0%) have expected count less than 5. The minimum expected count is .39.

H_1 = Health consciousness of customers is associated to their age group

H_0 = Health consciousness of customers is not associated to their age group

With the assumptions for a chi-square test for independence not met due to 12 cells (48.0%) having expected count less than 5 which is above 20%, the p-value (.684) is obtained from the “likelihood ratio” which is significantly greater than the selected significance level ($\alpha = .05$). This therefor leads to the non-rejection of the null hypothesis and conclusion that the health consciousness of customers is not associated to their age group.

4.2.2 How is GSCM implemented in SOSUCAM?

4.2.2.1 Green Procurement

Green procurement, as mentioned in our literature review, involves the acquisition of environmentally healthy material linked to the 3Rs in procurement (reduction, reuse and recycling of elements in the process of purchasing). SOSUCAM has already taken some significant steps as far as green procurement is concerned. SOSUCAM doesn't purchase sugarcane, which is its primary raw material.

According to the production officer of SOSUCAM (Personal communication, February 21, 2019); SOSUCAM cultivates its sugarcane which is being tested in their laboratories to determine the degree of sucrose content of the sugar cane, its duration, and other information, before using it for sugar production. These sugarcane varieties are of different varieties, namely; B 70532, B 87743, B 46364, Nco 376, Co 997, R 585, and others. SOSUCAM's agricultural engineers make a selection of which variety and the quantity to invest in depending on their need at that specific period. Some sugarcane types such as the Co 997 are rich in fiber, while others such as the B 46364 are rich in juice. So when SOSUCAM needs more fibers which are used as fuel to generate electricity and other uses, they invest more on the sugar cane rich in fiber.

On the other hand, when they need more juice for the production of sugar, they turn to invest more on sugarcane rich in juice. This saves SOSUCAM from buying sugarcane at fluctuating cost, and its transportation cost from the buyer to the company, which also reduces atmospheric emissions from their vehicles. After cultivation, it is harvested both manually and mechanically with adapted vehicles, and transported to the factory with the use of Suitable well adapted vehicles to minimize or prevent sugarcane falling apart during transportation from the plantation to the mill, which would have resulted in waste. Although SOSUCAM already uses bagasse as organic fertilizer in its sugarcane plantations rather than chemical fertilizer, it could equally incorporate the use of sugarcane tops and leaves obtained in the course of cultivation and harvesting. During this harvesting and cultivation, the farmers come across grass and sugarcane leaves which rather than being burned and wasted, could be crushed and reused as manure on the plantation.

According to Sugar valley News (Ed. 003), SOSUCAM has purchased highly efficient machinery to minimize the energy and time used in production, while realizing greater output. This efficiency enables SOSUCAM to reduce the release of toxic substances into the atmosphere.

SOSUCAM, on the other hand, purchases its packaging from Multiprint S.A, Cameroun Continu S.A, imports others from foreign companies, and manufactures others. SOSUCAM being one of the major clients to these firms can push these firms to produce environmentally healthy packages such as biodegradable packages, or plastics made purely from organic substances such as the Coca-Cola plant bottle which is 30% bio (coca-cola company, 2018) (Sugarcane.org, 2017) manufactured from bagasse and the Tetra Pak innovative 100% plant-based PE (Polyethylene) produced from sugarcane ethanol (Jones, 2013, April 7). To render this green approach, more effective SOSUCAM can incorporate environmental criteria in their supplier sorting process, which will push these companies to obtain environmental certifications such as ISO 14001. Some of these criteria involve; purchasing environmental friendly raw materials from suppliers who have acquired international environmental certifications such as; ISO14000, OHSAS18000 attesting their compliance to international environmental norms.

4.2.2.2 Green Manufacturing

Green manufacturing has to do with a highly efficient production process with relatively low environmental impacts; which generates little or no waste or pollution. According to the production officer, SOSUCAM's sugar manufacturing process consists of a succession of stages which are; juice extraction, juice purification, evaporation and crystallization. Once in SOSUCAM's factory, the harvested sugar cane is crushed to obtain "cane-sugar juice and fiber". The fiber or bagasse serves as "fuel" at the boiler, where the vapour is produced at 25 bars under a temperature of 350 degree Celsius, and this vapour is used to activate the turbines to produce electricity. SOSUCAM, therefore, produces its electrical energy using fiber, which is a renewable and environmental-friendly source of energy free from toxic release and environmental pollution. The energy value of bagasse is about 0.42 kilowatt-hours per kilogram.

After this stage, the juice is purified so as to get rid of the unwanted substances in the cane-sugar juice. From this process, press mud is obtained on one side and purified sugarcane juice. This Cane-sugar juice contains about 84% of water, which is therefore boiled so as to eliminate as much water as possible by means of evaporation so as to attain saturation. After evaporation what is left is the Cane-sugar syrup which is now crystallized (converted from liquid to solid-state). After the crystallization process, the crystals are segregated from the mother liquor and dried up to give the first shot of sugar. SOSUCAM produces three types of brown sugar having different colour textures, which involves Brown Sugar from the First shot, Brown Sugar from the Second shot, and Brown Sugar from the Third shot. Brown Sugar from the First shot which is the one obtained from cane-sugar juice which is being crystalized, after this first crystallization process, residues still containing some sugar are obtained, since all the cane-sugar syrup can't be crystallized. These residues derived from the first shot takes us to the second shot where it is once more crystalized, the residues obtained from this second crystallization which still contains some sugar is once more crystallized to give the Dark-Brown (caramelized) sugar. The residues obtained from this 3rd crystallization is called "Treacle" or molasses which is supplied to distilling company specialized in the production of Spirits and Liquors such as Fermencam, ADIC, etc. To obtain white sugar which is refined sugar where all minerals have been removed and left with sucrose; the first shot of brown sugar is melted, decolourized, and filtered to give cane-sugar syrup which is then crystallized to give white sugar which also is categorized into three different types, having three different colour textures. The first crystallization produces White Sugar from the First draft, the residues obtained are once more crystalized, since it's not possible for all the cane-sugar juice to be crystalized. This gives the sugar from the second draft. The residues obtained from this second crystallization are once again crystallized to produce the white sugar from the 3rd draft. The residues obtained from this 3rd crystallization are called "Treacle" or "molasses" which is supplied to distilling company specialized in the production of Spirits and Liquors such as Fermencam, ADIC. Sugar obtained from the first draft is what SOSUCAM supplies to brewery companies such as SABC for the production of juice. Sugar obtained from the second draft is what SOSUCAM supplies to companies such as; Nestle, while the third draft is what is supplied to consumers.

At this level so as to minimize energy used and pollution, SOSUCAM makes use of machines which emits little or no toxins in the environment, does more work in less time with lesser

electrical energy and does proper extraction of the sugarcane juice with little or no loss of juice in the bagasse or leakage. According to SOSUCAM's magazine Sugar Valley News, (Ed. 003), SOSUCAM has acquired some modern production machinery, theories and techniques which enable it to improve its production capacity with lesser energy use. With this, a more significant amount of sugarcane is being crushed due to the large capacity of the machine, leading to a reduction in energy usage in contrast to crushing lesser amount over a more extended period with more energy required.

After the production process, the machines are properly cleaned with the help of clean potable water rather than making use of chemicals to clean them. According to the DTMA officer, contrary to other agro-products such as beetroots, sugarcane is self-sufficient in the sense that it provides sources to generate its energy, and does not need any extra ingredient in the manufacturing process. Once sugar cane is crushed, cane-sugar juice and fiber are obtained, and at the end of the production process bagasse is obtained as waste which is used to produce bio-based energy healthy for the environment. SOSUCAM producing its energy reduces the expenses it would have incurred for subscribing under ENEO and spares it also from the recent prevailing inconveniences of power outage faced in Cameroon.

4.2.2.3 Green Package

Green package, also known as "ecological package", is an environmental-friendly package, which is completely made of natural plants, can be recycled or reused, be prone to degradation and promote sustainable development (G. Zhanga & Z. Zhao, 2012). SOSUCAM purchases its packaging from Multiprint S.A, Cameroun Continu S.A, imports some and equally manufactures others. Although its plastic packages are not biodegradable, SOSUCAM ensures that the plastic packages it purchases were manufactured following the specifications put in place by the state on the use of plastics, which states that it should either be biodegradable or superior to 60 microns (No.004/MINEPDED/MINCOMMERCE of 24 October 2012).

Nevertheless, plastic packages are considered toxic due to the negative impacts on health and the environment associated with their utilization. Most elements used in the manufacture of plastic packages are colourless, tasteless, and odourless, such that when aliments are packaged in them,

these elements melt off the plastic packages into the food unnoticed especially when exposed to heat, and this is detrimental to the human system. Bisphenol -A is one of the chemical substances found in most plastics, which can cause; breast cancer, low sperm count in men, chromosomal and reproductive system abnormalities, impaired brain and neurological functions, cancer, cardiovascular system damage, early puberty, obesity and resistance to chemotherapy (Achu, 2017). Plastic packages are most often disposed of inappropriately such that they end up as litter in the environment such as streets and drainage systems. According to science, it takes between 400 to 1000 years for plastic bags to decompose (Kirsty Bell & Suzie Cave, 2011), and the presence of these plastics in the ground obstructs the penetration of roots into the soil, therefore obstructing crop growth. Plastic packages are sometimes burned in an attempt to dispose of them, and they turn to release toxic gases such as; chlorofluorocarbon, hydro-chlorofluorocarbon, dioxins and furans, due to the fact that they are manufactured from petroleum byproducts such; as xylene, ethylene oxide and benzene, which causes respiratory problems and eventually cancer (Achu, 2017). A number of UK retailers have introduced two types of degradable carrier bags which degrade under certain conditions or after a specific time period. The first type is the Bio-degradable, which constitutes a small percentage of non-oil-based material such as corn starch, and the second is photodegradable, which decomposes only once exposed to sunlight (Kirsty Bell and Suzie Cave, 2011).



Figure 29: Dasani and Odwalla 100% recyclable plant bottle

(Shandra Martinez, 2011)

The global Coca-Cola Company which is one of SOSUCAM's clients has launched the production of the plant-bottle in 2009 used by the Dasani Water Company; this bottle is a 30% plant-based material with sugarcane being its primary ingredient (The Coca-Cola Company, 2018). According to A. Valavanidis (2018), the Coca-Cola Company upgraded its plant bottle in 2015 to a 100% bio-PET version with a sustainable source of ingredients: ethylene glycol and terephthalic acid. The company has as objective to switch entirely to bio-based plastics by 2020. This innovation has led to the reduction of about 30,000 metric tons of carbon dioxide and the use of fossil fuels with an estimated equivalent of 3 million gallons of gasoline used in the production of the traditional PET plastic bottles. Its rival Pepsi Company announced in the same year that it had found a way to create a PET plastic made entirely 100% of plant materials used

by the Odwalla juice Company. The plant-based materials for both bottles are produced through a process that turns sugarcane into a critical component for PET and HDPE plastic (Shandra Martinez, 2011). SOSUCAM can benefit from this innovation by acquiring packages manufactured with bio substances, or pushing its suppliers to acquire that technology which will be beneficial for environmental safety.



Figure 30: Tetra Pak's 100% plant based package and sugarcane bottle cap
(Lausanne, April 1, 2015)

Tetra Pak; the world's leading food processing and packaging solutions company has introduced its 100% bio innovative sugarcane bottle cap and a fully renewable plant-based package in conformity with its objective of providing safe, innovative and environmentally sound products across the world (Lausanne, April 1, 2015). According to Braskem SA, it is possible to produce polyethylene from ethanol with exactly the same characteristics as polyethene derived from petroleum. And goes further to state that; manufacturing one pound of petroleum-based polyethylene leads to the release of 2.5 kg of Co₂ into the atmosphere. Meanwhile, the same amount of sugarcane-based polyethene captures that same amount of Co₂ gas (J. Laumer, 2009, December 1). Since the introduction of the Tetra Pak in Brazil, the demands for the bio-based cap has experienced an exponential increase of about 610 million of the caps used in 2012, compared to 80 million in 2011, within which Tetra Pak counts major clients among global

corporations such as Nestlé and Coca-Cola. This shows the interest consumers and organizations across the globe attach to environmental-friendly products (F. Jones, Apr 07, 2013). This innovation is welcome as a substitution to the traditional plastic packages and bottle caps made from fossil fuels whose production releases Co₂, which is detrimental to health. SOSUCAM can consider making use of this technology for its "Doypack" package and the other plastic packages.

4.2.2.4 Green Marketing and Distribution

It feels good being able to tell a client that the product they have before them is 100% bio, this contributes in creating a positive corporate environmental image of the company, which can lead to an increase in sales especially in the international market where more clients are very conscious and interested in the environmental measures adopted by firms as seen in our literature review. SOSUCAM doesn't really communicate the green measures it implements with its customers, and according to the commercial officer, SOSUCAM uses various channels of communication such as the national radio and television; CRTV (Cameroon Radio and Television), newspapers, magazines, internet and others, and equally stated that so as to be properly enlightened on the environmental measures adopted by SOSUCAM, customers have to draw closer to the enterprise. SOSUCAM hasn't yet engaged in the sensitization of its customers on the importance of environmental preservation, the role/contribution of the consumers in the preservation of the environment, and the importance of incorporating environmental criteria in selecting which sugar to buy. This will call the attention of other consumers who neglected that environmental aspect. Providing the necessary key information linked to health and environment on sugar packages will be essential to get clients properly informed on for instance; the components or nutritional fact of the product they are consuming, and their various percentages or proportion to make better choices of what to purchase. It's therefore essential for SOSUCAM to incorporate a brief description of the components of its sugar on the packages for customers to be informed. And equally, include some information about the packages; if they are Biodegradable or not, etc. An example can be seen on the package of Zulka Morena pure cane-sugar in the image below.



Figure 31 Information on Zulka Morena Pure Canesugar package

(Researcher, 2018)

4.2.2.5 Green Recycling

The sugar production process is one that has a complete cycle such that the outcome and waste realized from each process can be reused for further production such that nothing is loosed at the end of the chain. SOSUCAM proceeds in the reuse of part of its waste products and commercializes part of this waste. Due to the fact that these waste substances still have value, they can be classified as by-products. SOSUCAM uses bagasse to as organic fertilizer, fuel to produce electricity and commercializes part to distilling companies such as ADIC and FERMENCAM for the manufacture of spirits and liquor. SOSUCAM also uses molasses as fertilizer and even on roads to prevent dust.

4.2.2.5.1 Sugar By-Products

There are several byproducts that can be derived from sugarcane processing as stipulated in our literature review such as; bagasse (obtained after juice extraction), Syrup (Obtained after Evaporation), molasses (obtained after Centrifugation), Filter Cake or press mud (Obtained after Juice Purification).

- Bagasse is a fibrous remainder of cane after extracting juice used as fuel, combustible to generate steam , nylon production, plastic production (Such as the Coca-Cola plant bottle which is 30% bio), cogeneration of exportable power, paper and pulp industry, chemical industry, animal feed, glass production, etc (http://shodhganga.inflibnet.ac.in/bitstream/10603/96542/12/12_chapter%203.pdf).
- Molasses can be used to produce power/electricity and industrial and potable alcohol (such as ethyl alcohol), fertilizer, road surfacing (after mixing with asphalt), Ethanol (which can be blended with petrol to be used as fuel for automobiles). The Sugar present in the molasses can also be utilized by using molasses directly for the production of; Cattle feed, Edible syrup, Acids (like citric acid, lactic acid, oxalic acid, maleic acid, butyric acid), Solvents and chemicals like ethanol, acetone, glycerol, Vinegar etc.
- Sugarcane ethanol can be used as a substitute for gasoline and also it has the potential to generate revenues through carbon credits.
- Press Mud or Filter Cake can be utilized almost entirely as manure, especially in acidic and saline soils since it contains a lot of nutrients, it could also serve as animal feed, wax and fat.
- Cane tops and leaves can be used to produce cardboard or wrapping paper, animal feed, and manure, etc. (http://shodhganga.inflibnet.ac.in/bitstream/10603/96542/12/12_chapter%203.pdf).
- Power/Energy is also generated from bagasse, which is used in the boiler as combustible to generate steam to turn the turbines and generate electricity.
- Ethanol is produced from molasses and can be used as a substitute for gasoline to produce polythene. The Ethanol produced here undergoes a purification process to produce fuel-grade ethanol which can be mixed with petrol. This purified ethanol can be used in vehicles, airlines, etc.

- Bio-fertilizers are obtained from bagasse, cane leaves and top.
- Husk obtained from crushed sugarcane can be used as input in the paper industry instead of wood from trees, which will help reduce deforestation since sugar cane grows faster than trees.

4.2.3 How beneficial is the Greening of the Sugarcane Sugar value chain by SOSUCAM?

This section will be answered based on information obtained during an interview with experts from the enterprise and documentations from the enterprise, the internet and other sources. We will make use of qualitative information while answering this research question.

4.2.3.1 Political and Legal

Greening the Supply Chain of SOSUCAM benefits both the state and SOSUCAM politically and legally. The implementation of GSC will contribute in boosting the image of the country on the international platform since environmental wellness, and sustainable development has become one of the prime concerns across the globe such that a lot of conventions are held linked to this topic. This also passes across the message on the international scene that the state watches over the implementation of the enacted laws and regulations within its territory. Such engagements easily attract the attention of some countries and NGO's who are so concerned about environmental care and will want to carry out some investments within the state. The implementation of environmental-friendly activities equally preserved SOSUCAM from governmental sanctions linked to the nonconformance to the enacted environmental protection laws and ratified conventions.

4.2.3.2 Economic

Greening SOSUCAM's Sugar supply chain will benefit SOSUCAM itself economically and also have external economic benefits. GSCM enables SOSUCAM to achieve efficiency through cost minimization at various levels of its supply chain and creating other streams of income. It

exempts SOSUCAM from the charges incurred for subscribing to ENEO for electricity and the monthly consumption of ENEO electricity. According to SOMDIAA group, (2017), SOSUCAM and the other affiliates produce up to 1,314,600 MWh of electricity from bagasse. It would have been more costly, coupled with complications such as the present prevailing electricity outage situation faced within the country for one reason or the other. The enterprise also benefits from lower raw material cost due to the recycling and reuse of material in the course of production rather than purchasing substitutes at a higher cost. SOSUCAM makes use of bagasse as a natural environmental-friendly combustible rather than purchasing coal for electricity production. It equally makes use of bagasse as a natural fertilizer for its cane plantation rather than purchasing artificial fertilizers, which is relatively costly.

SOSUCAM reduces wastage by making use of the waste substances obtained in the course of its production process to engage them for further production. The by-products obtained from sugarcane processing can enable SOSUCAM to generate extra revenue through their sales to other enterprises who need it as part of their raw materials. SOSUCAM can also take it through a revaluation process such that the finished product can be commercialized for more revenue. For instance, SOSUCAM merchandises its molasses and cane syrup to ADIC, Fermencam, and other enterprises which are being used as a raw material in the production of liquors such as Kitoko, King Arthur, etc.

Greening the SC of sugarcane will equally assist in promoting other economic activities by extending and broadening its supply chain, thus creating other chains of activities, and giving rise to new industries. Although SOSUCAM makes use of its waste product, it does not exploit it entirely, there is much more that could be done with these resources that earn more such as using ethanol obtained from cane sugar juice as a substitute to gasoil, using cane husk in the production of paper, and others mentioned in our literature review which will extend or give rise to a new supply chain.

The 100% bio Polythene can also be manufactured from ethanol and sold to generate additional income since polythene is used by almost all traders to wrap items purchased by their clients. Making effective use of these wastes can earn SOSUCAM a lot, and can even at a certain point convert some byproducts to co-products.

The implementation of GSC will earn SOSUCAM an excellent corporate image or reputation. This reputation or image is usually determined by the policies and actions of an organization. A negative environmental image can hamper the success of SOSUCAM especially on the international scene resulting to a loss in their market share in the global market, while a good corporate image can attract new international clients (Baresel-Bofinger & Ketikidis, 2011). We see the case of the company Tetra Pak which realized a drastic increase in sales of about 610 million of its bio-based bottle caps sold in 2012, against 80 million in 2011 since the launch of its bio-based products. Among these clients, we find global corporations such as Nestlé and Coca-Cola (Frazer Jones, Apr 07, 2013). This shows the interest consumers and organizations on the international scene attach to environmental-friendly products and actions. SOSUCAM being the leader in the Cameroonian sugar market can use the greening initiative to set a standard for the present and prospective competitors within the Cameroonian territory to follow, and can also influence companies in other sectors of activities.

4.2.3.3 Social

The social aspects are not left out as far as the positive impacts of greening the supply chain of SOSUCAM is concerned. On the social aspect, it contributes to job creation by creating opportunities for new enterprises to be established. For instance, during the interview granted by the communication officer of SOSUCAM, there were some entrepreneurs who came to get information on the availability of bagasse which they needed for their entrepreneurial projects. The creation of these enterprises will lead to the creation of jobs for the jobless Cameroonians, thereby reducing the rate of unemployment. Making use of bio packaging will contribute to preserving the health of consumers whose health could be gradually affected by the chemical content of the non-bio packaging, which is most often poorly disposed of. The country is already experiencing a lot of electricity outage and would have been more inconvenient for Cameroonians having SOSUCAM join the list of heavy consumers of electricity in the country such as ALUBASSA and other companies. Thanks to the greening initiative which proposes bagasse as an alternative in energy production.

4.2.3.4 Technological

The greening process involves the use of technology and requires expert knowledge, both skilled and semiskilled labour. This, therefore, creates room for Research and Development and organization of seminars and training programs, resulting in an innovative spirit and creativity within the enterprise, which is very necessary for competition in this 21st century.

4.2.3.5 Environmental

The adoption of the green initiative by SOSUCAM is hugely beneficial to the environment as this will contribute to the reduction of toxic substances being released in the environment. It participates to securing a healthy environment for all, therefore rendering "Law N°96-06 of 18 January 1996 to amend the Constitution of 2 June 1972" practical. Making use of bio packaging will save the environment from the non-bio packaging whose manufacturing process involves the use of toxic substances which are detrimental to the environment. The greening process here does not produce waste, since everything is sent back into the production process, therefore sparing the environment from the waste deposit. Biodiversity is also promoted in the course of the greening process. The greening process of sugarcane presents substitutes to other products such as bagasse which can replace the massif use of trees in the production of papers, thereby contributing to the reduction of deforestation, and improvement in biodiversity, knowing that growing sugarcane takes between 9 to 24 months (SMART Fertilizer Management, 2018), while a tree, on the other hand, takes a period of 10 to 30years to grow to full size (Better Homes & Gardens, February 17, 2017). Making use of biomaterials such as bagasse rather than coal, fossil fuels, or other unsustainable sources in the production of electrical energy contributes to the preservation of the environment.

4.2.4 How are the economic and environmental dimensions of GSC managed synchronously in SOSUCAM?

As seen in our literature review, the objective of SCM is mainly economic. For it seeks to render goods available to the final consumer at the right time, with the right quantity and quality, and at the lowest cost possible. GSCM incorporates environmental consideration into these economic or commercial objectives and activities, leading to a clear picture of the two dimensions/aspects of GSCM, which are the economic and environmental dimensions. SOSUCAM, just like any business, strives to maximise profit and minimise cost and therefore carries out various activities within its SCM process to achieve this. Also, environmental welfare being one of its concerns, and a legal requisition in Cameroon, it tries to put in place measures to incorporate environmental consciousness in its Activities.

According to the communication officer of SOSUCAM during an interview; the enterprise has acquired three international certifications from Bureau Veritas. Bureau Veritas is an international organization which helps clients across all industries address challenges in quality, health and safety, environmental protection (QHSE) and social responsibility. Furthermore, it seeks to reduce risk, improve its clients' performance and help them innovate to meet society's challenges with confidence (Bureau Veritas, 2019). SOSUCAM has acquired the; Quality (ISO 9001), Food Safety (ISO 22000), and Food Safety System Certification (FSSC 22000). Despite the fact that SOSUCAM has not yet acquired the environmental certification (ISO 14001) from Bureau Veritas, a publication on the SOMDIAA website states that SOSUCAM was in the process of getting this certification, coupled with the OHSAS 18001 by 2015. Although this date limit has not been respected, reason being; the complexity of the process involved. The acquisition of one certification from Bureau Veritas is a whole process which requires time and finances amounting to about 10millions FCFA per certification states a representative of Bureau Veritas. The acquisition of these certifications is not once and for all, as they have validity periods after which they will need to be renewed. It is, therefore, a good step for SOSUCAM to have already obtained three certifications from them this far. The rest are in progress, including environmental certification (ISO 14001). The chronology of acquisition of these certifications will depend on the management, objectives, and policies of each enterprise. For instance, the "Food Safety (ISO 22000)" and "Food Safety System Certification (FSSC 22000)" certification is of prime

importance because; it is difficult for any enterprise to undertake mass production of alimentary products involving mass consumption without assurance that the consumption of this product is without risk. And as for the Quality (ISO 9001) certification, it is difficult to certify an alimentary product without certifying that the process of production of this alimentary product was in accordance to norms (Representative of Bureau Veritas, Personal communication, February 21 2019). The acquisition of ISO 9001 involves the entire process, where all the departments are taken into account such as the communication, human resources, procurement, marketing, etc. (Communication officer SOSUCAM, Personal communication, February 21 2019).

According to SOSUCAM magazine Sugar Valley News (Ed. 001), the enterprise has equally acquired national certifications such as; NC 11: issued in 2001 by the Cameroonian Government following the audit run by an independent company certifying SOSUCAM's ability to produce sugar by international standards. There also is the Environmental compliance certificate issued by state authorities following an audit, showing SOSUCAM's commitment to carry out its activities while preserving natural resources, and its concern towards protecting the living environment of employees and local populations. In an attempt to minimize cost and some deceptions from suppliers, According to SOSUCAM's production officer, SOSUCAM engaged in the cultivation of its primary raw material, which is sugarcane. In the course of doing so, SOSUCAM incorporates environmentally sustainable measures so as not to hamper environmental wellbeing. SOSUCAM includes the use of Biofertilizer in its sugarcane plantations are known as bagasse, which comprises of waste obtained from its industrial process. This measure is firstly more economical to SOSUCAM since it doesn't spend finances to get this fertilizer. Secondly, it is an environmentally sustainable measure since its 100% bio.

After cultivation and harvesting, the sugarcane is transported to the mill where it is processed to obtain the various kinds of sugar. Apart from sugar, this process yields waste and byproducts such as; Bagasse, Molasses/treacle, syrup, cane tops and leaves. These waste and byproducts are being used by SOSUCAM in an environmentally friendly manner to gain more profit. A SOMDIAA Group publication in (2017) states that SOSUCAM produces up to 1 314 600 MWh of electricity from bagasse which would have been more costly and unreliable subscribing for this same amount of power from ENEO due to the complications such as the present prevailing

electricity outage situation faced within the country. SOSUCAM's communication officer states that SOSUCAM sales some of its waste to enterprises such as; ADIC, Fermencam, etc. which enables it to generate extra revenue. According to commercial representatives of ADIC SA and Fermencam SA which are distilling enterprises, they purchase sugar, cane-sugar juice and treacle from SOSUCAM which they use as a raw material in the production of Liquors and Spirits such as Rhum, Kiyoko, Lion d'Or, King Arthur, etc.

4.3 The implication of the Findings

The main aim of this research is to analyze the factors favouring and those obstructing the development of GSCM of Sugar in Cameroon (SOSUCAM). According to the analysis made using various indicators; Technology, Organizational strategy, Company size, Financial resource, Internal stakeholders, Legal and Institutional Framework, Customers, and Shareholders favour the implementation and growth of GSCM in SOSUCAM, while; Interdepartmental communication, External communication, Suppliers, Competitors, and Consumers disfavours the application and extension of GSCM. SOSUCAM has to work on the indicators that proved negative to convert them to positive elements which favour the smooth implementation and growth of GSCM.

4.4 Limitation of the Study

4.4.1 Scope of the Study

The topic of this research was selected to bring the supply chain's contribution to achieving sustainable development in Cameroon since GSC has two (2) of the aspects of SD, which are Economic and Environment. This study was limited to sugar because sugar is one of those alimentary products with a continuous increasing consumption rate across the globe, as seen in our introduction. Sugar is an almost indispensable commodity as it is consumed both directly and indirectly in pastries, candies, food, beverages, etc. In the majority of homes, we can find at least a dietary product which contains sugar, Sugar is, therefore, a valuable commodity which is worth studying. This finding emphasizes on sugarcane sugar because of the vast opportunities surrounding the exploitation of sugarcane, as it can take full charge of its supply chain, produce

its energy, reuse of its waste for various purposes, etc. SOSUCAM being the lead in the Cameroonian sugar market, and being the only company whose mill is established and produces its sugar within the Cameroonian territory, was selected as a case study for this finding. The other companies import their sugar and package for sales here in Cameroon (Representative of OK foods, Personal communication, February 21 2019).

4.4.2 Time Frame

The findings of this research lasted for 1 year as a result of the inaccessibility to information from the enterprise, where the enterprise personnel were not willing to provide the required information due to various reasons. The other staff saw the information demanded as being too technical and not of their competence such that other means were devised to acquire some knowledge.

4.4.3 Geographical Delimitation

As a result of financial constraints, this research focused on the Centre region and Littoral regions of Cameroon. The Center and Littoral regions were selected because they comprise both the political and economic capital of Cameroon, and can, therefore, be able to depict the situation in the other areas of the country.

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the findings, the conclusions, and recommendations of the analysis carried out in chapter 4. The conclusions regarding this research will be made based on the results from our findings and literature review. Recommendations based on the results of our finding will be made for the organization, industry and further research.

5.1 Summary of Findings

Presents the findings in brief sentences in line with the result presented in chapter 4.

5.1.1 Analyze the factors contributing to promoting and obstructing the development of GSCM of Sugar in Cameroon

The main objective of this study is to analyze the factors contributing in promoting and obstructing the development of GSCM of Sugar in Cameroon, and selected SOSUCAM as a case study; which is the leading brand in the Cameroonian sugar market. According to our findings, the various factors favouring and those obstructing the implementation and evolution of GSCM in Cameroon's sugar industry were identified in the case of SOSUCAM as summarized on the table below.

Table 18: Factors contributing to promoting and obstructing the development of GSCM in SOSUCAM

Variables		Indicators
Internal Variables	Technology	• Availability of appropriate modern technological equipment which can facilitate the implementation of GSCM.
	Organizational strategy	• Organizational value governing SOSUCAM's employee behaviour is favourable to GSC implementation. • The adoption of GSC goes in line with other strategies put in place by SOSUCAM such as profit maximization, cost minimization, gaining competitive advantage, reputation, and innovation.

		The presence of Training and Development sessions on environmental sustainability, SD, and CSR, although not in all departments, and doesn't involve all employees.
	Company Size	- The number of employees: about 8000 - The Capital of the company: 13,925 000 000 FCFA
	Financial resource	- The capital of the company: 13,925 000 000 FCFA - The turnover of the company: 60 billion FCFA per year
	Internal stakeholders	<i>Lack of employees' commitment from various departments towards the implementation and development of GSC.</i> - Managers are committed to the implementation and development of GSC. - The availability of environmental and SD experts.
	<i>Interdepartmental communication</i>	<i>The level of environmental awareness of the workers from various departments is not satisfactory.</i>
External Variables	Legal and Institutional Framework	- The presence of national and international laws, regulations and conventions regarding business practices, health and environmental protection from regulatory bodies such as Environmental protection laws, consumer protection laws, and health and safety requirements. <i>The absence of Government incentive to environmentally sustainable enterprises,</i> - The influence of institutions such as ministries, quality control organizations, NGOs.
	<i>External Communication</i>	<i>The level of communication existing between SOSUCAM and its customers and potential customers, especially regarding the environmental measures adopted and implemented is not satisfactory.</i> <i>There is no communication on the nutritional facts of SOSUCAM's sugar.</i>
	Shareholders	The presence of pressure or exigencies from shareholders on

		SOSUCAM to adopt and uphold environmentally viable practices. • Shareholders are concerned about environmental soundness.
	Suppliers	• <i>Supplier's environmental commitment is void.</i> • <i>The absence of environmental-based criteria in the suppliers sorting and product sourcing process.</i>
	Competitors	• <i>The orientation of competition in the Cameroonian sugar market is not focused on environmental sustainability.</i>
	Consumers	• <i>The absence of pressure from customers on SOSUCAM to adopt environmental practices.</i> • <i>The level of environmental consciousness of customers in purchasing aliments is very low.</i> • <i>Customers don't focus on the environmental integrity of the company while purchasing sugar.</i>
• <i>Factors favouring GSCM implementation and growth</i> • <i>Factors disfavoring GSCM application and extension</i> (Researcher, 2018)		

Based on the data collected per variable as seen on the table above, we were able to identify the favourable indicators per variable written in black, and the unfavourable indicators per variable written in red. After an analysis made, we were able to establish the variable in red as de-enablers to GSCM and the ones written in black as enabling factors to GSCM. This analysis was done such that where the indicators per variable weighed more on the negative, it was considered a de-enabling factor. On the other hand, where it weighed more on the positive, it was considered an enabling factor.

5.1.2 The implementation of GSCM practices in SOSUCAM.

The first specific objective of this study is to assess the implementation of GSCM practices in the Sugar industry in Cameroon, which was treated in chapter 4. We saw what is being implemented and how it is being implemented by SOSUCAM, and equally saw what should be included.

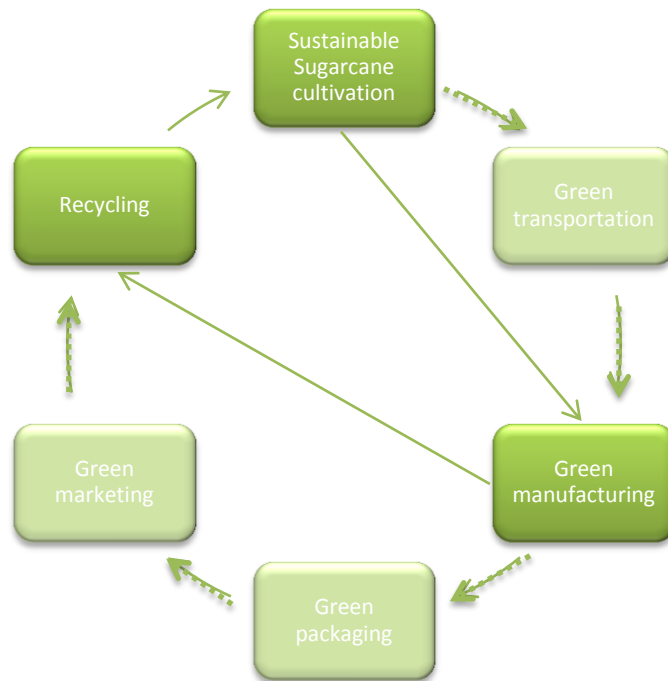


Figure 32: The implementation of GSCM practices in the Sugar industry in Cameroon
(Researcher, 2018)

The above diagram is a summarized pictorial illustration of the green measures implemented by SOSUCAM and those that need to be incorporated to improve on its implementation of GSCM. The green boxes represent the measures implemented by SOSUCAM, while the faded boxes represent measures to be incorporated. SOSUCAM applies sustainable sugarcane cultivation, which involves the use of bioproducts in the cultivation process of the sugarcane such as organic fertilizer obtained from bagasse, cane tops and leaves, which is economical to SOSUCAM and environmentally. SOSUCAM's green manufacturing process involves the use of a clean energy source in the production process to minimize pollution; such as making use of bagasse to produce electrical energy. It also incorporates the purpose of highly performing machinery with minimal emission of toxins in the environment, minimizes or avoids waste such as leakages, and minimizes energy usage; and should be adequately cleaned with clean potable water rather than chemicals. In recycling, SOSUCAM incorporates the revalorization of waste products obtained during the production process such as bagasse, molasses, press mud and others. Bagasse is used to generate electricity, fertilizer and commercialized. The uses of bagasse are so broad and can

also be extended to; nylon production, plastic production, paper, alcohol production, animal feed, glass production, etc.

Added to the implemented measures, SOSUCAM can incorporate the green transportation process, which involves the minimization of environmental pollution and waste incurred during transportation from the plantation to the mill. This should include the use of vehicles adapted to carry sugarcane with minimal loss of sugarcane on the road and making use of molasses to produce industrial and potable alcohol such as ethanol which can be blended with petrol to be used as fuel for automobiles as an alternative to gasoline. Green packaging has to do with the use of environmentally friendly packaging or bio packaging for all the varieties of sugar. Green marketing involves communicating with customers; providing them with environmental information even on the packages of the sugar to keep them informed.

5.1.3 The benefits of greening the value chain of sugarcane Sugar by

SOSUCAM

The second specific objective of this study is to examine the benefits of greening the SC of sugar, which was handled in chapter 4. GSCM implementation has a lot of advantages not only to the external environment but also on the enterprise implementing it, especially long term benefits. The benefits of greening the SC of sugar in our findings have been classified and summarized according to; legal and political, economic, social, technological and environmental benefits in the diagram below.

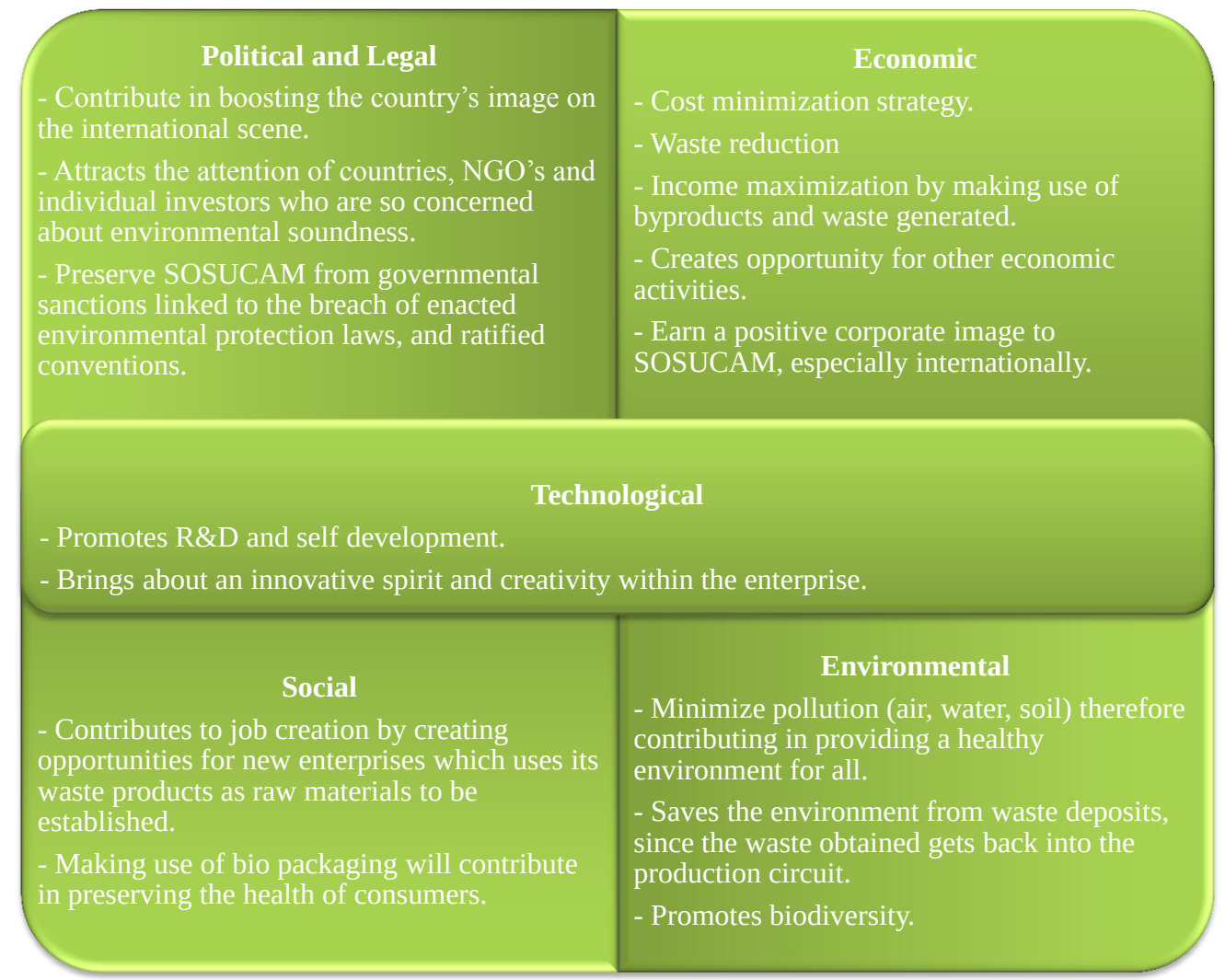


Figure 33: The benefits of greening the value chain of sugarcane sugar
(Researcher, 2018)

5.1.4 Analyze how the economic and environmental dimensions of GSC are synchronously managed in SOSUCAM

The third specific objective of this study is to analyze the relationship between the two aspects of GSC in SOSUCAM as treated in chapter 4. GSCM is an economic activity with environmental management incorporated in it which establishes the financial and environmental dimensions as the pillars of GSCM.

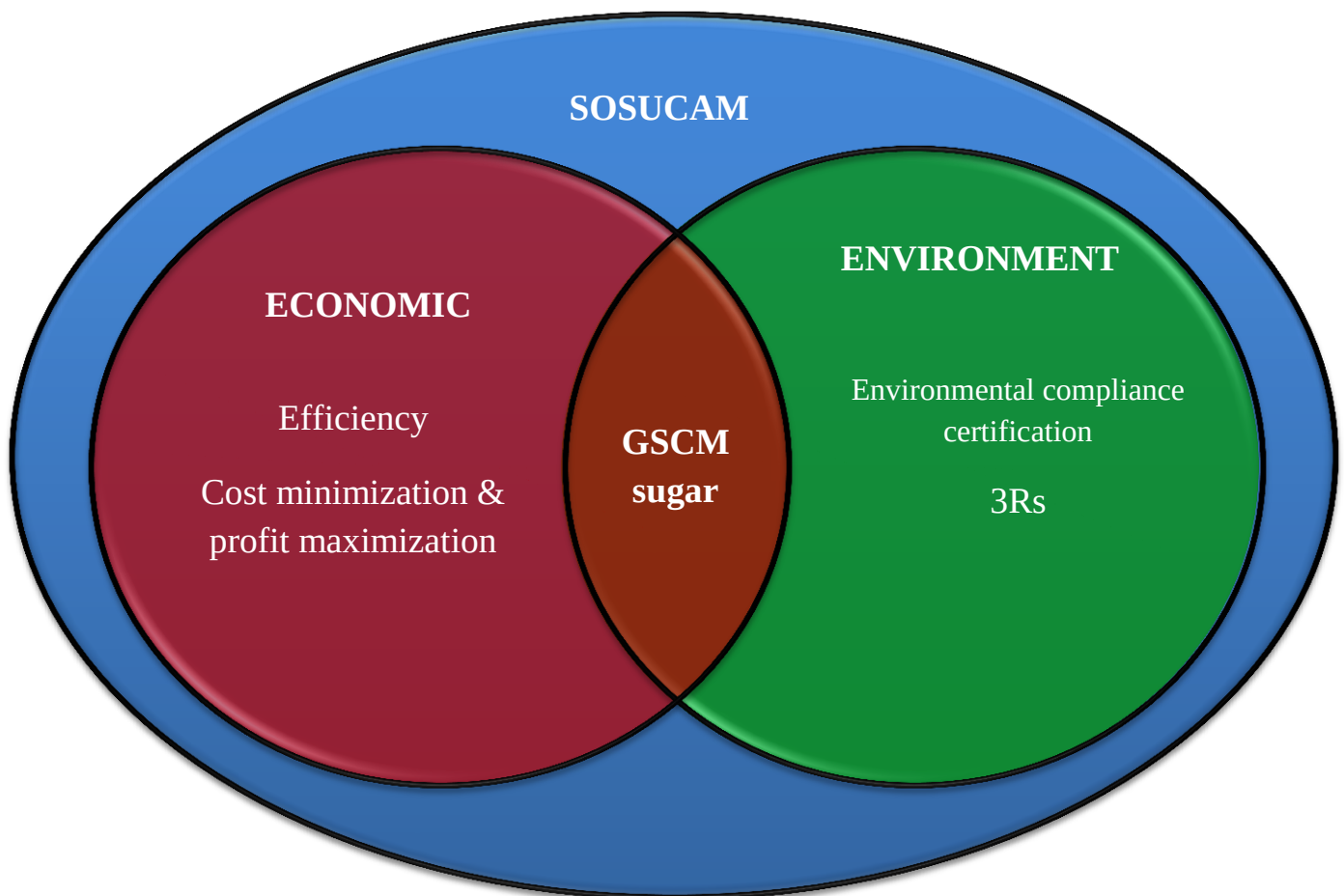


Figure 34: The two dimensions of GSCM in SOSUCAM

(Researcher, 2018)

In an attempt to strike a balance between profitability and environmental sustainability, SOSUCAM engaged various measures such as the acquisition of an environmental compliance certification from the state authorities demonstrating a strong commitment to carry out its

activities while preserving natural resources, and its concern towards protecting the living environment of employees and local populations and also launching the acquisition process of an environmental certification (ISO 14001) from group veritas which has a validity period after which needs to be renewed. SOSUCAM engaged in the sustainable cultivation of its primary raw material, which is sugarcane, where it uses organic fertilizer obtained from bagasse and sugarcane leaves and top, which are waste collected from the sugar production process. Byproducts obtained in the course of production such as; Bagasse, Molasses/treacle, syrup, cane tops and leaves are partly re-injected into the circuit, while the other portion is commercialized to other enterprises such as Fermencam and Adic which uses it for the production of spirit. SOSUCAM also uses bagasse in the production of up to 1 314 600 MWh of electricity which would have been more costly and unreliable subscribing for an equivalent quantity of power from ENEO.

5.2 Conclusion

Based on the results of our findings, SOSUCAM has already begun the adoption and implementation of environmentally sustainable measures at certain levels of its SC so as to minimize pollution and keep a sound environment which is firstly profitable to the enterprise and its workers who operates within this environment before being beneficial to the general environment at large and its constituents. Nevertheless more still needs to be done at various levels of its internal and external SC so as they render the greening of its SC more effective. For a more effective implementation and growth of GSCM in SOSUCAM, the Cameroonian sugar industry and Cameroon as a whole, it is essential for the various actors involved to take to their responsibilities so as to convert the various identified de-enabling factors to enabling factors and equally strengthen the enabling factors identified so as to achieve an effective and ever-growing GSCM in multiple sectors of activities.

5.3 Recommendation

Haven noticed the challenges linked to the development of GSCM of sugar in Cameroon, the following recommendations have been made;

5.3.1 To SOSUCAM

- SOSUCAM should incorporate SD and environmental sustainability methods in the training and development or sensitization program of its personnel from various departments to increase the commitment of their staff.
- SOSUCAM should strengthen its communication with its customers and potential customers, especially regarding the importance of environmental preservation and the various measures they adopt and implement in that like.
- SOSUCAM should incorporate strategic information on its sugar packages primarily related to consumers health and environments such as the nutritional facts of their sugar and the nature of the package.
- SOSUCAM should place environmental-based criteria in its suppliers sorting and product sourcing process to push suppliers to adopt environmentally sound products and processes environmental friendly products.

5.3.2 To the Government

- The state should provide incentives to environmentally sustainable companies or enterprises to encourage more enterprises to adopt GSCM. The state should, for instance, implement feed-in tariffs to enterprises making use of renewable energy.
- Cameroonian policymaker should adopt laws whereby each company is entirely in charge of collecting and recycling its packages, which will push companies to take measures
- The state administrative units and policymakers should reinforce actions taken to see to it that enterprises fully implement environmental laws.
- The government should adopt environmental tax or carbon pricing.

5.3.3 To consumers

- Customers should get conscious about environmental sustainability, and they should consider the contribution of each company to environmental sustainability as a criterion before purchasing its product to encourage companies to adopt GSCM measures.
- Customers should equally make a demand for healthy and environmentally friendly products.

5.3.4 Competitors

- Competitors should orientate competition towards GSCM/environmental sustainability or incorporate an aspect of ecological sustainability in the competition by sensitizing customers and prospective customers.

5.4 Suggested Areas for Further Research

Similar research can be carried out targeting respondents in other regions of the country, and even covering the 10 areas of the country.

Similar findings could be realized using another resource and another company as a case study.

An analogous study could equally be effectuated with a selected group of companies as a case study to identify these enablers and de-enablers of GSC of each of the companies and sort the ones they have in common, and the ones specific to each industry.

More extensive findings can be carried out on sustainable supply chain management, which incorporates the 3rd aspect of sustainability (social dimension) to the two mentioned in this research (economic and environmental dimensions).

In-Depth research could be carried out, focusing on the impact of GSC on the performance of the company.

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APPENDIX A

MANAGEMENT INTERVIEW GUIDE

ENABLERS AND DE-ENABLERS OF GREEN SUPPLY CHAIN DEVELOPMENT IN CAMEROON (CASE OF SOSUCAM)

SECTION A: PERSONAL INFORMATION

1. What is your post of responsibility
2. What is your Department

SECTION B: GENERAL INFORMATION ON GREEN SUPPLY CHAIN MANAGEMENT

Company Size

3. How many employees are in your company?

Organizational Strategy

4. Does environmental safety align with the company's strategies and goals?
If yes, which ones, and how?
5. What are the byproducts produced by your company, and how much Investment recovery does your company realizes from the sales of these byproducts?

Internal Stakeholders

6. Is there any official environmental Management unit in your company?
If yes, what precise role does it play?
7. Are there experts in the domain of environmental management and sustainable development in your company?
8. Do SOSUCAM's employees go through training and development sessions on sustainable development?

9. Does your company often organize workshops, Training and Development sessions for workers?

How efficient and effective are they?

Legal

10. What Environmental conscious measures has Your Company adopted?
11. Are your supply chain activities fully in accordance with government environmental regulations?
12. Are there any measures that have been applied to reduce air, water and land pollution along the company's supply chain?

Suppliers

13. Are there any environmental linked criteria in selecting your suppliers, and raw materials?
14. Are there any environmental related standards set for your suppliers to attain?

External Communication

15. Are there any environmental related information shared with customers, by your company to encourage green choices by consumers?

Technology

16. Does your company have corresponding IT tools to facilitate the implementation of environmental conscious processes?
17. Has your company brought in any innovative technology over the last 3years?
Which one is that, and how effective and efficient is it?
18. Does your company make use of renewable energy?

Management's Commitment

19. What strategies does your company apply to minimize energy consumption?
20. Does your company have an ISO 14001 certification? or any other Environmental safety linked certification(s)?
21. Does SOSUCAM implement corporate social responsibility?

- 22. Are sustainability issues highlighted in the course of decision making?
- 23. What measures can be taken at the level of your job to promote the adoption of GSCM activities?

Customers' Behaviour

- 24. Does your company experience any form of environmental related pressure from customers?

Other Relevant Information

- 25. Does the Company's activities Generate Waste along the Supply Chain?

How is this handled?

- 26. Does SOSUCAM use biodegradable packaging?
- 27. How does SOSUCAM proceed in transport emission reduction?
- 28. Can you describe the green practices adopted by your company? (At the level of Designing, purchasing, transportation, manufacturing, packaging and warehousing, Distribution)

APPENDIX B

SUGAR CONSUMERS QUESTIONNAIRE

ENABLERS AND DE-ENABLERS OF GREEN SUPPLY CHAIN DEVELOPMENT IN CAMEROON (CASE OF SOSUCAM)

Please kindly spare some time to fill this questionnaire whose purpose is to carry out an academic research on the factors that favors and disfavors the implementation of environmental friendly practices in SOSUCAM's line of activities.

1. Region

Littoral ☐ Center ☐

2. Gender

Male ☐

Female ☐

3. Age group.

18-25 ☐

26-35 ☐

36-45 ☐

46-55 ☐

55+ ☐

4. Which sugar brand do you often consume?

SOSUCAM ☐

Dethom ☐

SUMOCAM ☐

Dadidou ☐

Zulka ☐

Other

5. What are your criteria used for selecting which sugar to buy?

.....

6. Do you take into consideration the environmental integrity of an enterprise before consuming its sugar?

Never ☐

Rarely ☐

Sometimes ☐

Often ☐

Always ☐

7. Do you have any health related criteria in selecting which sugar to purchase or consume?

Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always ☐

8. Are you aware of the environmental measures implemented by the company whose sugar you consume in their cane sugar production and marketing process?

No ☐ Yes ☐

If yes, specify

.....

9. Are you aware of the environmental measures adopted by SOSUCAM in their cane sugar production and marketing process?

No ☐ Yes ☐

If yes, specify

.....

10. How satisfied are you with SOSUCAM's collaboration with its consumers in the course of carrying out its production and marketing activities?

Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely ☐

11. How satisfied are you with SOSUCAM's communication with its consumers?

Not at all ☐ Slightly ☐ Moderately ☐ Very ☐ Extremely ☐

12. What do you think about the price of sugar?

Very Low ☐ Low ☐ Moderate ☐ High ☐ Very High ☐

APPENDIX C



Picture 1: SOSUCAM's Sugar Sold in the Market



Picture 2 : Types of Sugar Produced by SOSUCAM



Picture 3: Consumables Containing Sugar



Picture 4: Types of Sugarcane Cultivated by SOSUCAM



Picture 5: Sugarcane Molasses/ Treacle



Picture 6: Sugarcane Bagasse / Fiber



Picture 7: Bio-Based Polyethylene products manufactured from Sugarcane



Picture 10: Brazilian Sugarcane - Ethanol Fuel Station
(Watts, 2017)



Picture 9: The Researcher and the Production Officer of SOSUCAM



Picture 8: The Researcher and the communication officer of SOSUCAM