

**SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES AND
OPERATIONAL PERFORMANCE OF MANUFACTURING FIRMS IN
MOGADISHU**


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DECLARATION

This research project is my original work and has not been presented to any other university for examination or award of a degree.

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This Research project has been submitted for examination with my authority as the university supervisor.

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DEDICATION

I dedicate this research to my family who supported me during my study in Kenya.

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ABBREVIATIONS AND ACRONYMS

CSR:	Corporate Social Responsibility
GDP:	Gross Domestic Product
GSCM:	Green Supply Chain Management
RBV:	Resource Based View
SSCM:	Sustainable Supply Chain Management
USA:	United States of America

ABSTRACT

The purpose of this study was to establish the relationship between sustainable supply chain management practices and operational performance of manufacturing firms in Mogadishu, Somalia. The study sought to achieve three objectives: To establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu, find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu, ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu and to determine the effect of sustainable supply chain management practices on operational performance of manufacturing firms in Mogadishu. The research took the form of a descriptive survey and all the 13 manufacturing firms in Mogadishu were involved in the study. Data was collected via questionnaires. It was established that key among the drivers of adoption of this concept include need to minimize costs, pressure from customers, pressure from civil society organizations, compliance with government regulations, pressure from media, the need to improve the public image of the firm, influence from other supply chain partners and desire to become a responsible corporate citizen. The study concluded that there are many sustainable supply chain management practices (SSCM) practices already adopted from various categories such as use of biodegradable materials, use of clean energy, minimal use of virgin materials and minimization of waste. The key enablers of SSCM adoption were top management commitment and support, availability of financial resources, availability of qualified personnel, availability of suppliers of sustainable inputs, employee receptiveness of the concept, stakeholder involvement, encouragement from customers, information sharing and type of regulatory framework a firm operates in. Collectively, the independent variables of the study: use of biodegradable materials, use of renewable and clean energy, minimum use of virgin materials and elimination of waste explain a significant percentage of the variance in operational performance of the manufacturing firms. The study recommends the adoption of renewable and clean energy such as wind power and zero use of plastics in manufacturing should be implemented among manufacturing firms in Somalia.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The environment in which organizations operate is highly dynamic and thus keeps on changing from time to time. Contemporary organizations are experiencing intense pressure emanating from different sources such as the market, the societies in which they operate, regulatory agencies as well as customers to exhibit sustainability responsibility in their operational (Santos, Gustavo & Javier, 2019). This in doubt has forced most organizations globally to adopt Sustainable Supply Chain Management (SSCM) practices in order to comply with the requirements of these stakeholders. In addition, the growing global competition among firms has forced firms to adopt SSCM practices that suit global standards.

The biggest global challenge of contemporary organizations is to carry out their business activities in a manner that reflects greater responsibility and accountability towards the society in which they operate and environment. In order for this to happen organizations must practice to be sustainability in their operational and management of supply chains (Ashby et al., 2012). In the initial stages as organizations embarked on the implementation of sustainability, the major focus was on the environmental issues. However, a lot of developments have taken place and SSCM as it is known today has extended to include the triple bottom line where environmental, social and economic concerns are the main areas of focus by organizations (Seuring, 2013).

This study is anchored on the resource-based theory and supported by the stakeholder theory. The resource-based theory was developed by Penrose (1959). The theory posits that an organization will depend on the uniqueness of its resources. The stakeholder theory on the other hand was developed by Freeman (1984) and it focuses on the importance of stakeholders in an

organization's activities.

Mogadishu is slowly coming back to normalcy and businesses are again being re-established. Manufacturing firms are among the businesses that have already been re-opened in Mogadishu. This is happening at a time when sustainable supply chain management is becoming a buzzword among most businesses. This study seeks to investigate adoption of supply chain management practices and their impact on operational performance of the manufacturing firms.

1.1.1 Sustainable Supply Chain Management

According to The World Commission on Environment and Development (1987) sustainability refers to the process of meeting the needs of the present generation without jeopardizing the ability of subsequent generations to meet their needs. The integration of this concept of sustainability with supply chain management is now an omnipresent discussion globally in many organizations. Many practitioners and academicians are now giving attention to this important concept which has significantly transformed the way organizations operate (Carter & Eston, 2011). Many organizations, more than ever before are directing their efforts and resources towards the implementation of sustainability practices.

Many practitioners in the field of sustainable supply chain management reveal that there are several factors that have influenced the implementation of this concept among contemporary organizations as well as its growth in the global landscape. Seman et al., (2012) argue that organizations are forced to implement sustainable supply chain management due to increasing pressure from different quarters. They further argue that there has been a lot of pressure from civil society organizations, the media fraternity, governmental agencies that perform regulatory functions, the communities where firms operate and customers who happen to be more informed

and possess awareness of sustainability. All the above-mentioned categories of stakeholders have exhibited increasing concern for the environment in recent times.

1.1.2 Operational Performance

Azim, Ahmed and Khan (2015) define operational performance of an organization as the measurable aspects of the outcomes of an organization's processes, such as reliability, production cycle time, and inventory turns. They further assert that operational performance improvement has a positive effect on the business performance of an organization. In a related research activity carried out by, Santos Gustavo and Javier (2001) it was suggested that operational performance of an organization can be measured using components such as cost, quality, delivery and flexibility.

Operational performance is a concept that has been considered by many entities as an important factor towards the success of firms regardless of the industry. According to Claye (2020) operational performance refers to the extent to which units in a firm work harmoniously in order to achieve the corporate objectives of the firm. It is evident from literature that there are many researchers who have dedicated their efforts towards research in operational performance. Developments in the corporate sector also reveal that many firms have set up departments responsible for operational performance in order to enhance their positions in the market. However, there are a myriad of challenges that face new firms because they have to seek answers to several questions before they make any significant progress. For any firm to succeed in enhancing its operational performance, a total transformation in the management of the business is necessary. With appropriate transformation it is then possible to create an agile business which is efficient (Claye, 2020).

There are various measures that can be employed in estimating a firm's operational performance.

The first category of operational performance measures is financial whereas the second category is non-financial. Both financial and non-financial measures have been used globally by various organizations. However, there has been growing interest in the use of the non-financial measures as can be witnessed by adoption of these measures by a number of manufacturing companies in Japan, Europe and USA which are considered to be focusing on a wide spectrum of measures such as efficiency, utilization, customer satisfaction and on time delivery (Abdel-Maksoud et al., 2005).

1.1.3 Manufacturing Firms in Mogadishu

Mogadishu being the capital city of Somalia is now moving towards attaining stability after many years of unrest resulting from the collapse of the Somalia central government in the year 1991. For a long period of time business operations were seriously disrupted and several business establishments were closed due to insecurity (SDRB, 2020). However, with the re-establishment of the central government business is now gaining momentum and a number of companies have been established and are fully in operation. Before the outbreak of the civil in 1991, there were approximately 53 small, medium and large state-owned manufacturing firms. However, most of them were destroyed during the civil war (Somali Development and Reconstruction Bank, 2020)

Over the past few years with relative normalcy in Somalia, a lot of local investment especially by the Somali diaspora has seen the revival of several manufacturing businesses and opening of new ones. Among the new manufacturing firms opened carry out manufacturing of various products such as pasta, mineral water purification and bottling, plastic bags, confectionaries, hides and skins, fabrics, soap and detergents, pillows and foam mattresses, stone processing and fishing boat construction. Mogadishu has the highest concentration of manufacturing firms of about 25. It is estimated that the manufacturing sector in Somalia contributes 10% of the country's GDP (SDRB,

2020).

1.2 Research Problem

The significance of adopting sustainable supply chain management is something that cannot be underestimated in the modern world. There is a lot of evidence from research that links sustainable supply chain management with performance. Zailani et al. (2010) sought to examine how environmentally friendly practices affect supply chain performance of manufacturing firms in the state of Penang, Malaysia. They carried out a cross sectional survey involving a sample of 700 companies which provided quantitative data that facilitated hypothesis testing. The research results revealed that environmentally friendly practices positively influenced implementation of green packaging the study indicated that eco-efficiency practices have a positive impact green packaging adoption which in turn impacts on supply chain performance of the Firm

Available studies relating to corporate environmental and social responsibility present discussions on financial implications on some specific industries. One such study is by Perry and Towers (2013) who sought to examine specific drivers of CSR targeting the fashion sector and this included with customers preferred, level of vendor-buyer relationships, long-term firm ~~aim~~ rationalization of the supply chain as well as integration of supply chain. However, there are several issues that were identified as hindrances towards achievement of CSR. This included pressure relating to price, nature of the product, labor intensity, customer purchasing practices, complex nature of the supply chain and distribution of power in the value chain.

In the year 2014 research was conducted by Ortas et al. (2014). The purpose of their study was to evaluate the association between sustainability in the supply chain and the financial performance of a firm with the intention of accumulating empirical evidence on the two variables. The

understanding behind this study was that these two variables still had an unclear association. The research adopted multivariate analysis as well as performance of causality tests. Looking at the findings from the study, it was found that there existed a bidirectional causality association between sustainable supply chain and the margins and revenues earned by a firm. However, the relationship between the profitability of the firm and SSCM performance was highly unidirectional.

In as much as there are a number of benefits that are associated with the adoption of sustainable supply chain management by contemporary organizations, a lot is yet to be done. There are several myths, obstacles and challenges that characterize the sustainable supply chain management landscape (Alzawawi, 2014). Somalia is a country that is slowly emerging from civil unrest and firms have started adopting sustainable supply chain management practices. This study will seek to establish how adoption of sustainable supply chain management practices has affected the operational performance of manufacturing firms in Mogadishu. This will be achieved by seeking answers on what are the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu? Which sustainable supply chain management practices have been adopted by manufacturing firms in Mogadishu? What are the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu? What is the effect of supply chain management practices on operational performance of manufacturing firms in Mogadishu?

1.3 Research Objectives

The main objective of the study was to determine the effect of sustainable supply chain practices on operational performance of manufacturing firms in Mogadishu, Somalia. The specific

objectives were:

- i. Establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu
- ii. Find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu
- iii. Ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu
- iv. Determine the effect of sustainable supply chain management practices on operational performance of manufacturing firms in Mogadishu

1.4 Value of the Study

The findings of this study will assist the manufacturing companies in Somalia to understand how adoption of sustainable supply chain management practices affects their operational performance. This will enable them to better conceptualize the significance of sustainable supply chain management.

Research on sustainable supply chain management in Somalia is still limited since the country is healing from years of civil unrest. This study will be very important in providing valuable information to other researchers on the state of sustainable supply chain management in Mogadishu, Somalia. It will form the basis for further study in the future.

The results from the study will also be very important in policy formulation especially in the manufacturing sector in Somalia. It will provide valuable information that will influence policy

formulation especially on matters relating to sustainable supply chain management.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

In this chapter, studies carried out by other researchers on SSCM have been carefully reviewed and their findings summarized. Among the key sections covered in the review includes drivers of SSCM, practices associated with SSCM and factors that lead to successful implementation of SSCM.

2.2 Theoretical Foundations

This section is a review of the key theories that support the study on sustainable supply chain management and operational performance. This study relies upon two important theories which include the Resource Based View and the Stakeholder theory.

2.2.1 Resource Based View

This theory first came into limelight after the seminal presentation by Penrose (1959) where he sought to elaborate and provide a theory explaining the growth of firms. According to Penrose a firm was nothing other than a collection of internal resources that formed the basis upon which differentiation and success of firms was founded. The assertion by Penrose was later given a boost by Rubin (1973) who also agreed that organizations were typically a combination of resources. However, the complete RBV was not coined until later when Wernerfelt (1984) presented a comprehensive work on RBV. Other researchers such as Barney (1991); Grant (1991) and Collis and Montgomery (1995) made significant contribution to the development of RBV.

According to Dyer and Singh (1998) RBV emerged as a result of some researchers disagreeing on the five forces model as the foundation of a firm's competitive advantage. The proponents of

RBV (Barney, 1991; Peteraf, 1993) had a totally different opinion which placed resources at the centre of an organization's competitive advantage. They argued that firms have unique resources which also happen to be diverse in their composition. According to the above proponents these resources may be tangible or intangible and the competitive advantage of a firm will therefore depend entirely on how unique its resources are when compared to the other firms. Barney (1991) elaborated further on the resources of a firm by pointing out examples of resources such as assets, knowledge capabilities, information, attributes of a firm, firm's processes and others that provide a firm with the opportunity to plan and implement effectiveness and efficiency strategies.

The relevance of RBV to this study is based on the agreement with the position held by the key proponents that an organization comprises of a collection of resources internal to it. As Barney (1991) puts it, these resources may include knowledge and information available to the organization and others that assist in bringing efficiency and effectiveness. Adoption of SSCM is one such improvement that brings efficiency and effectiveness in an organization. In addition, adoption of SSCM practices depends of the availability of resources in an organization.

2.2.2 Stakeholder Theory

The term stakeholder with its contemporary meaning and use can be credited to an inhouse memo at the Stanford Research Institute (1963). The purpose of the memo then was to counter the argument that a firm needed to be responsive to stakeholders only. However, work on the stakeholder theory did not begin in 1963 until two decades later when Freeman (1984) and other scholars presented significant arguments in support of the stakeholder theory.

The proponents of the stakeholder approach (Freeman, 1984; Jones, 1995, Walsh, 2005) argue that there are three key problems that businesses face and these include value creation and trade,

capitalism ethics and managerial mindset. They further assert that how well these three problems are solved will depend on the interrelations that exist among the various individuals or groups who influence or are impacted by the activities of the organization. Listed among these individuals and groups are suppliers, customers, employees, the owners of capital and finance, the community within which the firm operates and the management who must collaborate in order to create value and trade the same. The stakeholders of a firm have diverse and conflicting interests which must be addressed sometimes through tradeoffs for the betterment of the organization (Freeman, Wicks & Harrison, 2008).

The stakeholder theory is important in understanding the drivers of SSCM management adoption. Stakeholders such as customers, the community through civil society organizations and media have played significant roles in the adoption of SSCM practices by business entities. The Stakeholder theory is therefore key in forming the foundation of this study on SSCM and operational performance of manufacturing firms in Mogadishu.

2.3 Sustainable Supply Chain Management Practices

Adoption of sustainability initiatives in any organization depends a lot on capability (Dabhilkar et al., 2016; Pullman et al., 2009). This is the reason why in research SSCM practices have also been considered as part of an organization's active competences (Kilubi & Rogers, 2018; Reuter et al., 2010). SSCM practices provide a clear roadmap on how business enterprises can design and implement sustainability initiatives throughout the entire supply chain from upstream to downstream (Khnoen et al., 2018).

There are several definitions of SSCM that have been fronted by different researchers. According to Pagell and Wu (2009) SSCM refers to very specific activities performed by management in an

organization with the objective of transforming the supply chain into a sustainable one. However, another definition considers SSCM as an aspect of supply chain management which focuses on ensuring stability in the activities of an organization with regard to social, economic and environmental dimensions. Some of the sustainable supply chain practices in manufacturing set up may include:

2.3.1 Use of Biodegradable Materials

Sustainability promotes conservation of the natural environment or putting in place strategies that will enhance recovery of the damage that has been done on the environment as a result of non-sustainable manufacturing practices in the past (Khnochen et al., 2018). One of the ways through which manufacturing firms can achieve environmental sustainability is through the use of biodegradable materials. This can be implemented through proper sourcing of materials by identifying suppliers of biodegradable inputs into the manufacturing process and ensuring that the packaging that is used is biodegradable. This is very important in keeping carbon out of the atmosphere (Seuring & Muller, 2008).

2.3.2 Use Clean and Renewable Energy

For a long time, most manufacturing processes have depended on the use of fossil fuels as a source of energy. The effect of using fossil fuels in manufacturing has accumulated over time and has caused profound negative effect on the environment. Sustainability requires that manufacturing firms design new ways of producing without releasing a lot of carbon to the atmosphere. The use of clean energy sources such as solar energy and wind energy is a very important step towards eliminating emissions. There is evidence in various countries where solar energy has been used to power manufacturing facilities and to provide lighting during the day in

commercial buildings (Seuring & Muller, 2008). The manufacturing processes can also be redesigned for less pollution (Green et al., 2012).

2.3.3 Minimum Use of Virgin Materials

As the world's population continues to increase, the demand for products also continues to increase. This has pushed firms to overexploit the available resources in order to meet the needs of the ever-increasing population. However, this trend is likely to cause problems for future generations. Some of the resources are not renewable hence will get depleted after some time and this will cause a huge problem. Sustainable manufacturing requires that firms commit themselves to minimal use of virgin materials in order to safeguard future generations. This can be achieved through re-use and recycling of the available materials (Khnoke et al., 2018). Water as a resource also needs to be used carefully hence recycling of water especially in the manufacturing process is a very important sustainable practice (Seuring & Muller, 2008).

2.3.4 Elimination of Waste

There are different types of waste that may exist along the supply chain. However, in the manufacturing set up firms need to work towards eliminating all types of waste (including elimination of non-value adding processes, resources and others) (Khnoke et al., 2018). However, there are many other practices which go beyond the manufacturing set up and may not be relevant for discussion in the current research which focuses on manufacturing firms in Mogadishu.

2.4 Drivers of Sustainable Supply Chain Management

Enormous pressure is being mounted on firms globally to adopt sustainability in their activities. (Varsei et al., 2014). Research in sustainability matters defines these pressures as drivers, triggers or equally as enablers (Koksal, et al., 2017). In a related study, the sustainability pressures have

been defined as the forces that necessitate the adoption of SSCM practices by an organization (Caniato, et al., 2012). Another term that has been used to refer to the pressures on Adoption of sustainability is motivators (Hsu, et al., 2013). Based on the above definitions by various researchers, it can be summarized that the drivers for SSCM are simply the factors that are responsible in motivating or influencing implementation of SSCM practices in an organization.

Varsei et al., (2014) asserts that there are different categories of SSCM drivers. The categorization is based on the level of influence the driver has on adoption of sustainability in an organization. as a result of these three main categories of drivers have emerged namely: coercive, normative and mimetic drivers. One of the most popular and frequently mentioned drivers of SSCM relates to regulatory environment. Research reveals that both at the domestic and international level there are several regulatory institutions which have put in place rules and regulations that must be observed by firms in order to ensure that their operational and activities are in line with sustainability requirements. These regulatory institutions force organizations to adopt SSCM practices as part of compliance requirements so as to avoid fines and penalties (Schrettle, et al., 2014).

Another significant driver of SSCM that has been frequently mentioned by firms is pressures originating from the society. The society has several expectations from the firms that operate within their environment. Among the key players in the society that compel organizations to adopt SSCM practices include various interest groups that force firms to account for their activities. Other stakeholders that also put pressure on firms include the press, non-governmental organizations, environmental protection organizations, consumer associations as well as value added networks (Harms, Hansen & Schaltegger, 2013).

There are other drivers that have been mentioned by other researchers. These include drivers that influence the market shape such as decisions made by investors relating to sustainability adoption (Schrettle, et al., 2014); pressure from customers and owners of the firm as well as supply chain network partners (Govindan, et al., 2016); integration of SSCM into the strategic plan of the organization (Haverkamp, Bremmers & Omta, 2010); the resources an organization has at its disposal as well as its culture (Schrettle, et al., 2014).

2.5 Enablers in Implementation of SSCM

There are several factors that influence the successful implementation of SSCM in an organization. Key among these factors is the commitment of the top leadership of the organization which is very critical in the designing, development and production of products that meet sustainability criteria (Subramanian & Ramanathan, 2012). SSCM implementation requires allocation of different types of resources in adequate proportions and this can only be achieved if there is buy in from the top management of the organization.

Another essential factor in success of SSCM is the positive impact created by the encouragement originating from the end users of the products. Consumers are the ones who utilize the products manufactured by firms hence their encouragement plays a key role in making organizations successful in implementing SSCM initiatives. Contemporary end users have a lot of knowledge on what they want as far as their expectations are concerned. Once their expectations are reflected in the goods and services they produce, they will encourage firms responsible to produce more through increased purchase of the products (Yoon & Park, 2014).

Availability of sustainable sources of inputs is very key to the successful implementation of SSCM in an organization. In cases where there are no sustainable sources of inputs, there is need

for the concerned organization to engage in supplier development in order to develop appropriate ~~verbs~~ of the required inputs (Cerchione & Esposito, 2016). The success in adoption of SSCM practices will also depend on the expected return on investment. Business firms seek to maximize profits and therefore what they gain from adopting these practices must outweigh the cost.

Other key enablers that have been mentioned by researchers include effective communication concerning sustainability adoption (Kishna et al., 2017); relevant legislation and regulations also provide an important framework for implementation of SSCM (Chardine- Baumann & Botta-Genoulaz, 2014).

2.6 Operational Performance

Operational performance is a very critical issue that determines the future wellbeing of an entity. According to Brealey et al., (2009) considers operational performance as the efficiency which an organization utilizes its assets in order to generate income from its operational. Green et al. (2012) assert that operational performance includes quality, productivity, efficiency, and flexibility. They also considered product quality under operational performance, which is classified under competitiveness. Enhancing companies' image in the market can improve firms' competitiveness measures, since the market share will be increased (Fousteris et al., 2018).

According to LarMarco (2019) indicates quality relates to the extent to which a product adapts to some specific requirements or its reliability and durability. On the other hand, he asserts that flexibility relates to the ability of operations to adjust product lines to new requirements. Efficiency as an operational performance measure relates to cost minimization in order to maximize on the benefits the firm enjoys from its operations while productivity may be measured in many ways including the units of output a firm is able to produce over a period of time

(LarMarco, 2019).

Brealey et al., (2009) also argue that the performance of a firm can be perceived from two perspectives. The first perspective is the financial one whereas the other is the non-financial one. They further indicate that financial performance can be measured in terms of solvency of the firm, profitability of the business, how liquid the firm is, debt repayment capacity among others.

2.7 Sustainable Supply Chain Management and Operational Performance

Sustainable supply chain management is becoming popular among many firms globally. Lysenko-Ryba and Zimon (2021) argue that supply chains need to be encouraged to adopt sustainability not only because it enables them to achieve efficiency in resource utilization but because it also enables the firms to focus on the three key pillars of economic, social and environmental issues. They further argue that implementation of sustainable supply chain management by an organization is likely to have a long term effect on the operational efficiency of the firm. It is therefore imperative to note that sustainable supply chain management when adopted in an organization serves two important functions. The first is to improve the performance of the organization and the other is to enhance the performance of other supply chain partners in a competitive environment (Cook, Heiser & Sengupta, 2011).

According to Le (2020) adoption of sustainability practices by firms may not be as a result of the free choice of the firms involved but rather as a result of the pressure mounted by other stakeholders such as regulatory agencies. Le further notes that when a firm is compelled to adopt sustainability in its supply chain management it not only complies with regulations but also assists other sustainable businesses to continue complying with set regulations. However, it is important to note that apart from complying with policies and regulations, adoption of sustainability in

supply chain management has become very essential for companies that are keen on thriving in the marketplace. Companies that thrive do so because they have embraced sustainability which in turn improves their operational performance.

2.8 Empirical Review

Juma, Zimon and Ikram (2021) conducted a study to determine the Relationship between Supply Chain Practices, Environmental Sustainability and Financial Performance. The study focused on evidence from manufacturing companies in Jordan. The study utilized a sample of 376 respondents and adopted Structural Equation Modeling in testing the hypotheses. The findings from the study revealed that SSCM practices have a significant impact on environmental sustainability of an organization. The key SSCM practices that were found to impact on environmental sustainability were the extent of information sharing, customer relationship management, quality of information among others. The results further showed that the financial performance of the firms was positively impacted by environmental sustainability.

Another study was carried out by Le (2020) on the effect of green supply chain management practices on sustainability performance in Vietnamese construction materials manufacturing enterprises. The sample of the study were 218 fabricators of materials for construction. The study mainly focused on examining how some specific GSCM elements impacted on the various aspects of operational performance. The findings indicated that designing and manufacturing green had a positive effect on three outcomes whereas green procurement had a positive impact on economic and social performance but had no influence on environmental performance.

Another related study was conducted by Golicic and Smith (2013). The main objective of the research was to determine the linkage between SSCM practices and performance of the firm.

The specific area of focus was environmental dimension of sustainability for a period of more than twenty years. The researchers were interested in determining whether there was any link between environmental sustainability and the performance of the firms. The findings out of the study confirmed that there was a significant positive link between sustainable environmental practices and performance of the firms.

Green et al., (2012) also did research with a sample of 159 managers from manufacturing business enterprises. The managers were requested to provide responses on the level to which their entities collaborated with sources of inputs and end users in enhancing environmental dimension of sustainability. It was established that the adoption of GSCM practices by the respective firms resulted to improvement of both the economic and environmental performance.

From the literature that has been reviewed, it is evident that there are some research gaps that need to be bridged. First, most of the studies that have been carried out have focused mainly on supply chain management practices and performance of firms (Juma, Zimon & Ikram, 2021; Liet al., 2006). Therefore, the studies fall short of addressing issues related to sustainability in supply chain management. This leaves a research gap that requires to be addressed.

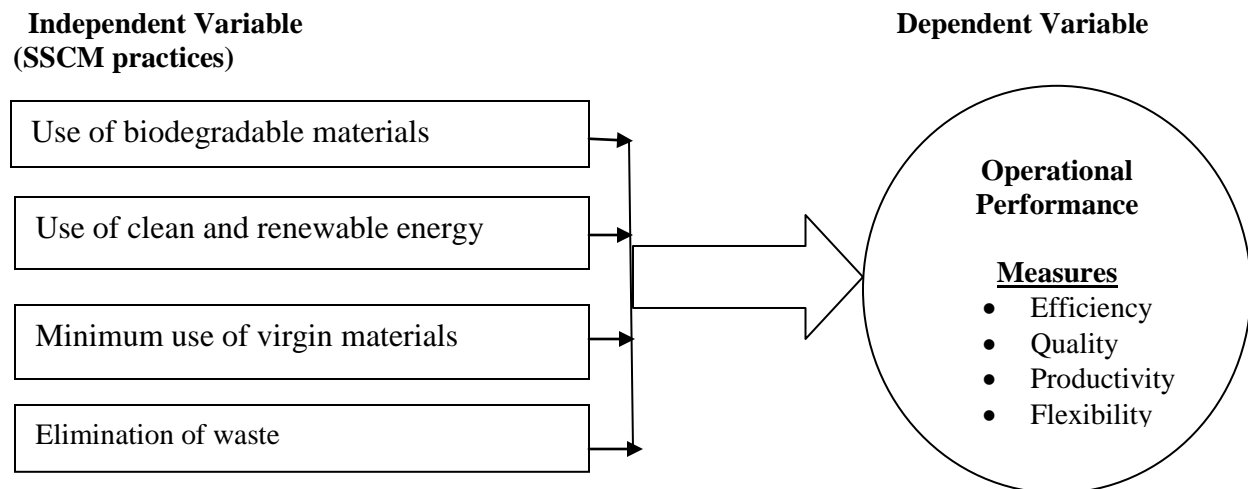
Another knowledge gap that is evident relates to research bias towards green supply chain management. Several studies (Golicic & Smith, 2013; Green et al., 2012) have mainly talked about environmental sustainability and green supply chain management and firm performance. The studies addressed only one dimension of sustainability thus leaving out social and economic sustainability. Therefore, they never focused on the effect of all the three sustainability dimensions on firm performance. This is the second knowledge gap that comes out of the literature review.

Finally, most studies have focused on firm performance and not operational performance. Firm performance is a broad concept which entails the use of different measures. There is also limited research on manufacturing firms in Mogadishu. This study will therefore seek to establish the effect of sustainable supply chain management on operational performance of manufacturing firms in Mogadishu.

2.9 Conceptual Framework

The definition of conceptual framework as fronted by Camp (2001) indicates a structure adopted by a study in order to facilitate natural progression of the phenomenon under investigation. It provides a diagrammatic representation or illustration of the inter-relationship among the research variables. For this research, operational performance is the dependent variable while the explanatory variables of the research are the various practices adopted and factors that lead to success in SSCM adoption.

Figure 2.1: Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Methodology in research may simply be considered as the different methods applied by the researcher in carrying out a study. In addition, it may also be regarded as a practical means of problem identification and solving (Kothari, 2004). Mentioned in this section are the important aspects of methodology applied in carrying out the research. Described herein are the design adopted, population being targeted, data collection tools and their administration, methods of analyzing data as well as presentation of the results.

3.2 Research Design

An appropriate design incorporates the methods utilized by the researcher in collecting, analyzing and measuring the data collected during the research while taking into consideration the study's research questions. Kothari (2004) intimates that efficiency in research can be achieved through adoption of appropriate research design. Kothari (2004) further indicates that a design is a well thought out plan on how data will be collected and analyzed in line with the research's guiding aims.

The appropriate research design that addressed the aims of this study was descriptive research. This design was considered because of its suitability in a precise manner the findings on key variables of the research. The other benefit of this design is its ability to assist the researcher conduct research without interfering with the elements or subjects. The other reason for its consideration is based on the understanding that it facilitates description of the elements under observation (Kothari, 2004).

3.3 Population of the Study

Population refers to a group of people or objects that is the main focus of a research problem (Blakstad, 2008). This study was a survey of the manufacturing firms that are situated in Mogadishu, Somalia. The thirteen firms formed the target population for this study. The total number of manufacturing firms in Somalia was thirteen. According to Mugenda (2010) at least 10 percent of the population is adequate for a sample. However, the target population is small and therefore no need of sampling. This study was a census of all the thirteen manufacturing firms in Mogadishu.

3.4 Data Collection

Questionnaires were employed in collecting primary data from the study respondents. The questionnaires to be designed contained a mixture of open as well as closed ended questions. The questionnaires contained four distinct areas. The first section was focusing on the respondent demographic questions; second section focused on drivers, third section on SSCM practices, fourth section on enablers and fifth section on relationship between the variables. The key respondents were the Supply Chain Managers of the Manufacturing firms. Due to the prevailing global Covid 19 pandemic, the questionnaires were administered through mail.

3.5 Data Analysis

After data collection, the data was inspected to ensure that only relevant and accurate data was retained for analysis. Quantitative data from the questionnaires was analyzed using descriptive statistics like mean and standard the findings were presented in Tables and graphs. A summary of the research objectives and how they were analyzed is presented in Table 3.1.

Table 3.1: Summary of Objectives and Analysis Methods

Objectives	Variable	Analysis Method
Establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu	Drivers of SSCM	Descriptive statistics - Mean and standard Deviation
Find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu	SSCM Practices	Descriptive statistics - Mean and standard Deviation
Ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu	Key success factors	Descriptive statistics - Mean and standard deviation
Determine the effect of sustainable supply chain management on operational performance of manufacturing firms in Mogadishu	SSCM and Operational performance	Correlation and Multivariate linear regression analysis

Three specific objectives were analyzed using descriptive statistics specifically the mean and standard deviation. These specific objectives included: to establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu, to find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu and to ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu. The fourth specific objective to determine the effect of sustainable supply chain management on operational performance of manufacturing firms in Mogadishu was analyzed using correlation and multiple linear regression analysis.

In conducting multiple linear regression analysis, the following regression model was adopted:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where Y represented the dependent variable operational performance of the manufacturing firms in Mogadishu and this was measured using efficiency in resource utilization.

α represented the value of operational performance when the value of X is zero

$\beta_1 - \beta_4$ are the regression coefficients of the respective independent variables of the study.

X_1 = Use of biodegradable materials

X_2 = Use of clean and renewable energy

X_3 = Minimum use of virgin materials

X_4 = Elimination of waste

e = the error term representing other variables outside this study which also had an effect on operational performance of the manufacturing firms in Mogadishu.

CHAPTER FOUR: FINDINGS AND DISCUSSIONS

4.1 Introduction

The purpose of this study was to establish the relationship between sustainable supply chain management practices and operational performance of manufacturing firms in Mogadishu, Somalia. The study sought to achieve three objectives: Establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu, find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu, ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu and to determine the effect of sustainable supply chain management practices on operational performance of manufacturing firms in Mogadishu. Data was collected from manufacturing firms in Mogadishu and the findings are presented next.

4.2 Response Rate

The study involved a census of all the thirteen manufacturing firms in Mogadishu. Questionnaires were administered to all the thirteen supply chain managers in the manufacturing firms and the results on response rate are presented in Table 4.1 below.

Table 4.1: Response Rate

	Frequency	Percent
Questionnaires Returned	10	76.9
Questionnaires not returned	3	23.1
Total	13	100.0

A total of 10 out of the 13 questionnaires that were distributed were successfully completed and

returned back to the researcher. This represented 76.9 percent response rate for the study. This response rate was considered adequate to enable the researcher to generalize the findings of the study on all the manufacturing firms in Mogadishu.

4.3 Demographic Findings

The first section of the questionnaire that was used to collect data from the respondents contained two questions on demographic information of the respondents. The aim of the questions was to assist the researcher to ascertain the suitability of the respondents in providing relevant and informative data for the purpose of achieving the objectives of this study. The findings on demographic information are presented next.

4.2.1 Designation of the Respondent

The respondents were requested to provide information concerning their designations in the manufacturing firms they worked with. Various options were provided representing various positions found in the supply chain department of an organization. The results are presented in Table 4.2.

Table 4.2: Designation

Position	Frequency	Percent
Operational Manager	2	20.0
Procurement Manager	7	70.0
Production Manager	1	10.0
Total	10	100.0

It was evident for the research findings that majority of the respondents who represented 70 percent of the total number of respondents were procurement managers in their respective manufacturing firms. However, 20 percent were operational managers whereas 10 percent of the respondents were production managers. This was an indication that the study successfully managed to collect data from respondents who had appropriate knowhow of the issues that were being queried in the study.

4.2.2 Sector of Manufacturing

The researcher requested the respondents to provide information concerning the sector of manufacturing their firms represented. They were provided with three broad categories to choose from and the results are tabulated in Table 4.3 below.

Table 4.3: Sector of Manufacturing

Sector	Frequency	Percent
Food processing	3	30.0
Chemical and allied	1	10.0
ICT and allied	6	60.0
Total	10	100.0

The results on sector of manufacturing revealed that 30 percent of the firms were from the food processing sector, 10 percent were from the chemical and allied sector while majority of the firms represented by 60 percent of the total number of firms in the study were from the ICT and allied sector. This implied that each of the three sectors of manufacturing were represented and the findings could be generalized on all the sectors of manufacturing in Mogadishu.

4.3 Drivers of Sustainable Supply Chain Management Adoption

The study sought to establish the drivers of adoption of sustainable supply chain management practices among the manufacturing firms in Mogadishu. The respondents were provided with a variety of drivers and they were required to indicate the extent to which they agreed with each one of them. The scale of 1 to 5 was applicable where 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent. The data collected was subjected to analysis to obtain the mean and standard deviations as presented in Table 4.4 below.

Table 4.4: Drivers of SSCM adoption

Driver	N	Min	Max	Mean	STD Deviation
The need to minimize costs	10	2	5	4.35	.722
Pressure from customers	10	2	5	4.23	.750
Pressure from civil society organizations	10	1	5	4.21	.657
Compliance with government regulations	10	2	5	4.20	.712
Pressure from media	10	1	5	4.18	.659
The need to improve the public image of the firm	10	2	5	4.14	.694
Influence from other supply chain partners	10	2	4	3.89	.702
Desire to become a responsible corporate citizen	10	1	4	3.76	.642
Desire to be more innovative	10	2	3	3.41	.634
Genuine concern on adverse effect of unsustainable manufacturing Practices	10	2	3	3.27	.598
Valid N (Listwise)	10				

The research findings reveal that there are a number of drivers that have led to the implementation of sustainable supply chain management practices among the manufacturing firms in Mogadishu. The respondents agreed to a large extent that the following have been drivers of adoption of SSCM practices among manufacturing firms in Mogadishu: The need to minimize costs (mean 4.35, standard deviation 0.722), Pressure from customers (mean 4.23, standard deviation 0.750), Pressure from civil society organizations (mean 4.21, standard deviation 0.657), Compliance with government regulations (mean 4.20, standard deviation 0.712), Pressure from media (mean 4.18, standard deviation 0.659), The need to improve the public image of the firm (mean 4.14, standard deviation 0.694), Influence from other supply chain partners (mean 3.89, standard deviation 0.702) and desire to become a responsible corporate citizen (mean 3.76, standard deviation 0.642). All the above drivers had a mean greater than 3.5 but less than 4.5 an indication that majority of the respondents agreed to a large extent that they have shaped the implementation of SSCM practices among the manufacturing firms in Mogadishu. The findings further revealed that there were two drivers that had a mean less than 3.5 but greater than 2.5 an indication that majority of the respondents agreed to a moderate extent that they have influenced the adoption of SSCM practices among the manufacturing firms in Mogadishu. These were: desire to be innovative (mean 3.41, standard deviation 0.634) and genuine concern on adverse effect of unsustainable manufacturing practices (mean 3.27, standard deviation 0.598).

4.4 SSCM Practices Adopted by Manufacturing Firms in Mogadishu

The research sought to establish the SSCM management practices adopted by the manufacturing firms in Mogadishu. The respondents were provided with a variety of SSCM practices divided into four categories namely: those related with the use of biodegradable materials, those related with use of renewable and clean energy, those related with minimum use of virgin materials and

those related with elimination of waste. The respondents were required to indicate the extent to which each of the SSCM had been adopted among the manufacturing firms in Mogadishu using the scale 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent. The data collected was analyzed using the mean and standard deviations and the results are presented in Table 4.5 below.

Table 4.5: SSCM practices adopted

Practices	N	Min	Max	Mean	STD Deviation
Use of biodegradable materials					
Use of biodegradable manufacturing inputs	10	3	5	4.87	.984
Sustainable sourcing of inputs	10	3	5	4.76	.942
Use of biodegradable packaging materials	10	2	4	4.64	.713
Minimum use of harmful chemicals	10	1	5	4.59	.469
Zero use of polythene and related products in manufacturing	10	1	3	2.83	.542
Use of Renewable and clean energy					
Reduction in carbon emissions from manufacturing plants	10	2	5	4.75	.746
Use of solar energy	10	1	5	4.66	.876
Use of wind power	10	1	5	2.21	.476
Use of alternative fuel vehicles to reduce emissions	10	1	3	2.13	.517
Minimum use of virgin materials					
Re-use of some materials in manufacturing	10	3	5	4.69	.721
Recycling of some materials to manufacture new products	10	2	5	4.62	.654

Recycling and reuse of packaging materials	10	3	5	4.58	.847
Water recycling	10	1	2	1.21	.432
Elimination of waste					
Reduction of manufacturing lead time	10	2	5	4.98	.651
Reduction of manufacturing set up time	10	3	5	4.83	.814
Elimination of downtime	10	3	5	4.79	.923
Ensuring value for money in procurement activities	10	2	5	4.76	.688
Better utilization of warehouse and storage space	10	3	5	4.52	.856
Implementation of empty backhaul management practices	10	3	5	4.51	.743
Improved health and safety in the manufacturing facility	10	1	4	3.35	.625
Valid N (Listwise)	10				

It was established from the research results that there were several SSCM management practices that had been adopted by the manufacturing firms in Mogadishu. Concerning the practices on use of biodegradable materials, it was revealed that four practices had a mean greater than 4.5 implying that the respondents agreed that they had been adopted to a very great extent among the manufacturing firms in Mogadishu. These include: Use of biodegradable manufacturing inputs (mean 4.87, standard deviation 0.984), Sustainable sourcing of inputs (mean 4.76, standard deviation 0.942), Use of biodegradable packaging materials (mean 4.64, standard deviation 0.713), Minimum use of harmful chemicals (mean 4.59, standard deviation 0.469) and zero use of polythene and related products in manufacturing. However, zero use of polythene and related products in manufacturing had a mean of 2.83, an indication that it was adopted by the manufacturing firms to a moderate extent.

Concerning the SSCM practices on the use of renewable and clean energy, the study established

that two out of the four practices had been adopted to a very large extent by the manufacturing firms in Mogadishu. These practices were: reduction in carbon emissions from manufacturing plants (mean 4.75, standard deviation 0.746) and use of solar energy (mean 4.66, standard deviation 0.876). However, the study results revealed that there were two SSCM related to use of renewable and clean energy had been adopted by the manufacturing firms in Mogadishu to a small extent. These practices were: use of wind power (mean 2.21, standard deviation 0.476) and use of alternative fuel vehicles to reduce emissions (mean 2.13, standard deviation 0.517).

The study findings also revealed that three SSCM practices relating to the minimum use of virgin materials had been adopted by the manufacturing firms in Mogadishu to a very large extent. These practices were: re-use of some materials in manufacturing (mean 4.98, standard deviation 0.651), recycling of some materials to manufacture new products (mean 4.62, standard deviation 0.654) and recycling and reuse of packaging materials (mean 4.58, standard deviation 0.847). However, water recycling was found to be adopted to a very small extent since it had a mean of 1.21. This was an indication that water recycling is not common among manufacturing firms in Mogadishu compared to the other three practices.

On elimination of waste, a total of six SSCM practices were found to be adopted by the manufacturing firms in Mogadishu to a very great extent. These six practices were: reduction of manufacturing lead time, reduction of manufacturing set up time, elimination of downtime, ensuring value for money in procurement activities, better utilization of warehouse and storage space and implementation of empty backhaul management practices. All the above six practices had a mean greater than 4.5 indicating that they had been implemented to a very great extent. On the other hand, improved health and safety in the manufacturing facility had a mean of 3.35 an

indication that it was adopted to a moderate extent by the manufacturing firms in Mogadishu.

4.5 Enablers of Adoption of SSCM Practices

The researcher wanted to ascertain the enablers in implementation of SSCM practices among manufacturing firms in Mogadishu. The respondents were provided with several key success factors and were required to indicate the extent to which they considered them as enablers in the implementation of SSCM practices among the manufacturing firms in Mogadishu. The scale of scale 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent was applicable. The data collected was analyzed using the mean and standard deviation. The results are illustrated in Table 4.6 below.

Table 4.6: Enablers of SSCM implementation

Enablers	N	Min	Max	Mean	STD Deviation
Top management commitment and support	10	2	5	4.92	.614
Availability of financial resources	10	2	5	4.89	.657
Availability of qualified personnel	10	2	5	4.78	.713
Availability of suppliers of sustainable inputs	10	2	5	4.74	.684
Employee receptiveness of the concept	10	1	5	4.72	.467
Stakeholder involvement	10	2	5	4.70	.558
Encouragement from customers	10	2	5	4.66	.732
Information sharing	10	1	5	4.64	.498
Type of regulatory framework a firm operates in	10	3	5	4.58	.876
Level of intra and inter-operational communication	10	1	5	3.21	.557
Valid N (Listwise)	10				

The research findings as tabulated in Table 4.6 above reveal that out of the ten key success factors, nine were considered by the respondents to a very large extent as enablers of implementation of SSCM practices. These were: top management commitment and support, availability of financial resources, availability of qualified personnel, availability of suppliers of sustainable inputs, employee receptiveness of the concept, stakeholder involvement, encouragement from customers, information sharing and type of regulatory framework a firm operates in. All these enablers had a mean greater than 4.5 as indicated in Table 4.6 thus confirming that they were considered to a very great extent by the respondents as key enablers to successful implementation of SSCM practices. Level of intra and inter-operational communication had a mean of 3.21 implying that it was considered to a moderate extent as an enabler of SSCM implementation among the manufacturing firms in Mogadishu.

4.6 Effect of SSCM practices on operational performance

The last objective of the study was to determine the effect of sustainable supply chain management practices on the operational performance of manufacturing firms in Mogadishu. This was done through multiple regression analysis where the SSCM practices were the independent variables whereas operational performance was the dependent variable. The results are presented in Tables 4.7 to 4.9 below.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.840 ^a	.706	.684	.724

a. Predictors: (Constant), Use of biodegradable materials, Use of renewable and clean energy, minimum use of virgin materials, elimination of waste

The results as presented in Table 4.7 reveal that the adjusted coefficient of determination is 0.684.

This implies that 68.4 percent of the operational performance of the manufacturing firms in Mogadishu can be attributed to the implementation of sustainable supply chain management practices.

Table 4.8: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.214	2	16.738	31.966	.000 ^b
	Residual	20.945	7	.524		
	Total	71.159	9			

a. Dependent Variable: Operational performance

b. Predictors: (Constant), Use of biodegradable materials, Use of renewable and clean energy, minimum use of virgin materials, elimination of waste

The results in Table 4.8 above on analysis of variance reveal that the p-value for the relationship between implementation of SSCM and operational performance of manufacturing firms in Mogadishu was 0.00. Since this test was being carried at 0.05 significance level, and the P-value is lower than the significance level, it implies that there is a statistically significant relationship between the variables of the study.

Table 4.9: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.868	.423		7.144	.000
	Use of biodegradable materials	.847	.140	.457	5.031	.000
	Use of renewable and clean energy	.520	.132	.362	2.422	.030
	Minimum use of virgin materials	.412	.121	.316	2.311	.020
	Minimization of waste	.323	.114	.244	2.213	.010

a. Dependent Variable: Operational performance

The results of regression coefficients for each of the independent variables reveals that all the four had p-values less than 0.05. This was an indication that there was a statistically significant relationship between each of the independent variables and the dependent variable. The Beta values (regression weights of each of the independent variables were: Use of biodegradable materials 0.847, use of renewable and clean energy 0.520, minimum use of virgin materials 0.412 and minimization of waste 0.323. Therefore, the model that can explain the relationship between SSCM and operational performance of manufacturing firms in Mogadishu can be explained by the equation: $Y = 3.868 + 0.847X_1 + 0.520X_2 + 0.412X_3 + 0.323X_4 + 0.423$.

4.7 Discussion of Findings

The study established that the need to minimize cost, pressure from customers, compliance with government regulations and pressure from civil society organizations were among the key drivers of adopting sustainable supply chain management practices among the manufacturing firms in Mogadishu. These results are very much in line with the findings of Schrette, et al. (2014) who also mentioned the above drivers and other.

It was also revealed from the study findings that manufacturing firms in Mogadishu have adopted the use of biodegradable materials such use biodegradable manufacturing inputs, Sustainable sourcing of inputs, use of biodegradable packaging materials and minimum use of harmful chemicals. These findings reverberate the results that were obtained by Seuring & Muller (2008) who also mentioned adoption of the same practices in other firms.

The research findings further established that the manufacturing firms in Mogadishu have adopted sustainable supply chain management practices relating to use of renewable and clean sources of energy. Among the practices adopted were the use of solar energy and the reduction of emissions

from manufacturing facilities. These same sentiments were also echoed by other researchers such as Seuring & Muller (2008). However, this study established that water recycling is yet to be embraced by the manufacturing firms as alluded by Seuring & Muller (2008) in their study.

Finally, the study established that sustainable supply chain management practices relating to minimum use of virgin materials had been adopted by the manufacturing firms in Mogadishu. These include recycling of materials, re-use of materials. These findings are in agreement with the findings of Khnoken et al. (2018) who also arrived at similar findings.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to determine the impact of sustainable supply chain management on operational performance of manufacturing firms in Mogadishu. This chapter presents the summary of findings, conclusions as well as recommendations made based on the research findings.

5.2 Summary of Findings

The study sought to achieve four objectives namely: Establish the drivers of sustainable supply chain management adoption among manufacturing firms in Mogadishu, find out the sustainable supply chain management practices adopted by manufacturing firms in Mogadishu, ascertain the key enablers in adoption of sustainable supply chain management practices among manufacturing firms in Mogadishu and to determine the effect of sustainable supply chain management practices on operational performance of manufacturing firms in Mogadishu.

The research findings revealed that there were a number of drivers that have facilitated the implementation of SSCM practices among the manufacturing firms in Mogadishu. Key among these drivers were the need to minimize costs, Pressure from customers, Pressure from civil society organizations, Compliance with government regulations, Pressure from media, The need to improve the public image of the firm, Influence from other supply chain partners and desire to become a responsible corporate citizen. The above drivers were found to have greater weight in the implementation of SSCM since majority of the respondents considered them very important.

On the other hand, there were some drivers that were found to influence adoption of SSCM to a

moderate extent. These were: desire to be innovative and genuine concern on adverse effect of unsustainable manufacturing practices. The respondents considered these two to have less weight in influencing SSCM implementation among manufacturing firms in Mogadishu.

Concerning the sustainable supply chain management practices adopted by the manufacturing firms in Mogadishu, it was established that the firms have adopted a variety of these practices. Among the practices relating to use of biodegradable materials adopted by the firms include: use of biodegradable manufacturing inputs, sustainable sourcing of inputs, use of biodegradable packaging materials, minimum use of harmful chemicals and zero use of polythene and related products in manufacturing. All these were considered by respondents as having been adopted to a great extent. The study results also established that there were other practices that had been adopted by the manufacturing firms but to a moderate extent. These include zero use of polythene and related products in manufacturing. This implies that most of the firms were yet to achieve zero use of polythene and other related products in manufacturing.

From the research results a number of enablers of successful implementation of SSCM were established. Key among the enablers of SSCM adoption in the manufacturing firms in Mogadishu were: top management commitment and support, availability of financial resources, availability of qualified personnel, availability of suppliers of sustainable inputs, employee receptiveness of the concept, stakeholder involvement, encouragement from customers, information sharing and type of regulatory framework a firm operates in. These were considered by the respondents as the most important enablers in the adoption of SSCM practices among manufacturing firms in Mogadishu. Only one enabler was not considered as key but was weighed as having moderate effect in adoption of SSCM practices and this was the level of intra and inter-operational communication.

This was the last objective of the study that sought to determine the effect of SSCM practices on the operational performance of manufacturing firms in Mogadishu. The findings revealed that the three independent variables of SSCM: use of biodegradable materials, use of renewable and clean energy, minimum use of virgin materials, elimination of waste explained 68.4 percent of the variance in operational performance of the manufacturing firms. This relationship was found to be statistically significant at 0.05 significance level. All the independent variables were individually found to have a statistically significant relationship with operational performance of the firms.

5.3 Conclusion

Sustainable supply chain management is a concept that is already gaining popularity among the manufacturing firms in Mogadishu. Key among the drivers of adoption of this concept include need to minimize costs, Pressure from customers, Pressure from civil society organizations, compliance with government regulations, pressure from media, the need to improve the public image of the firm, influence from other supply chain partners and desire to become a responsible corporate citizen. There are many SSCM practices already adopted from various categories such as use of biodegradable materials, use of clean energy, minimal use of virgin materials and minimization of waste. The key enablers of SSCM adoption were top management commitment and support, availability of financial resources, availability of qualified personnel, availability of suppliers of sustainable inputs, employee receptiveness of the concept, stakeholder involvement, encouragement from customers, information sharing and type of regulatory framework a firm operates in. Collectively, the independent variables of the study: use of biodegradable materials, use of renewable and clean energy, minimum use of virgin materials and elimination of waste explain a significant percentage of the variance in operational performance of the manufacturing firms.

5.4 Recommendations

The results revealed that use of renewable and clean sources of energy such as wind power is yet to be exploited by most of the manufacturing firms in Mogadishu. Wind power has huge potential of reducing emissions emanating from use of fossil fuels in manufacturing. It will be important to develop wind power generating systems to assist the firms achieve the objective of less emissions in their manufacturing processes.

It was further evident from the research that genuine concern on adverse effect of unsustainable manufacturing practices ranked poorly among the drivers of SSCM. It may be necessary to carry out sensitization among the manufacturing firms so that they can understand better the impact of unsustainable manufacturing practices. The regulatory environment in Somalia needs also to be strengthened through appropriate laws to assist in influencing adoption of SSCM.

It was also revealed that zero adoption to the use of plastics and other related materials in manufacturing and packaging had not been achieved by manufacturing firms. It will be necessary for the manufacturing firms to set targets through the assistance of the industry regulator concerning achievement of this objective.

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APPENDICES

Appendix I: Research Questionnaire

Introduction

The purpose of this questionnaire is to assist in gathering data on the effect of sustainable supply chain management on operational performance of manufacturing firms in Mogadishu. The data collected will be held confidential and shall not be divulged to any other person. Kindly respond to the questions by ticking appropriate responses.

Section A: Demographic Information

1. Indicate your designation

- Operational Manager
- Procurement Manager
- Production Manager
- Other (Specify).....

2. Sector manufacturing firms belongs to:

- Food Processing
- Chemical and allied ICT and allied
- Other (Specify).....

Section B: Drivers of Sustainable Supply Chain Management Adoption.

Kindly indicate the extent to which the following are considered as factors that have necessitated the adoption of sustainable supply chain management practices in this manufacturing firm. Use the scale 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent

	Driver of SSCM	1	2	3	4	5
1	The need to minimize costs					
2	Desire to be more innovative					
3	Compliance with government regulations					
4	Pressure from civil society organizations					

5	Pressure from media					
6	Pressure from customers					
7	Desire to become a responsible corporate citizen					
8	Influence from other supply chain partners					
9	The need to improve the public image of the firm					
10	Genuine concern on adverse effect of unsustainable manufacturing Practices					

Section C: Sustainable supply chain management practices

Kindly indicate the extent to which the following sustainable supply chain management practices have been adopted by this manufacturing firm. Use the scale 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent

	SSCM Practices	1	2	3	4	5
	Use of biodegradable materials					
1	Use of biodegradable packaging materials					
2	Use of biodegradable manufacturing inputs					
3	Zero use of polythene and related products in manufacturing					
4	Minimum use of harmful chemicals					
	Sustainable sourcing of inputs					
	Use of renewable and clean energy					
1	Use of solar energy					
2	Use of wind power					
3	Reduction in carbon emissions from manufacturing plants					
4	Use of alternative fuel vehicles to reduce emissions					
	Minimum use of virgin materials					
1	Recycling and reuse of packaging materials					
2	Re-use of some materials in manufacturing					
3	Recycling of some materials to manufacture new products					
4	Water recycling					
	Elimination of waste					
1	Reduction of manufacturing lead time					
2	Elimination of downtime					
3	Reduction of manufacturing set up time					
4	Improved health and safety in the manufacturing facility					
5	Ensuring value for money in procurement activities					
6	Better utilization of warehouse and storage space					
7	Implementation of empty backhaul management practices					

Section D: Key success factors

Indicate the extent to which you consider the following as key enablers in adoption of sustainable supply chain management. Use the scale 1= Very small extent, 2=Small extent, 3=Moderate extent, 4=Large extent and 5=Very large extent

	Key Success Factors	1	2	3	4	5
1	Top management commitment and support					
2	Encouragement from customers					
3	Availability of financial resources					
4	Availability of qualified personnel					
5	Type of regulatory framework a firm operates in					
6	Availability of suppliers of sustainable inputs					
7	Employee receptiveness of the concept					
8	Level of intra and inter-operational communication					
9	Information sharing					
10	Stakeholder involvement					

Section E: Operational performance

Indicate the level of improvement achieved by the firm in the following aspects of operational performance as a result of adopting sustainable supply chain management. Use the scale: 1=No improvement at all, 2= small improvement, 3= Moderate improvement, 4= great improvement and 5=very great improvement.

	Operational Performance Measure	1	2	3	4	5
	Efficiency					
1	Elimination of waste					
2	Minimization of costs along the supply chain activities					
3	Better utilization of resources					
	Quality					
1	Products meet requires					
2	Products produced are more durable					
3	Products are more reliable					
	Productivity					
1	Output from production process is greater than input					
2	Cost of production is lees compared to units produced					
	Flexibility					

1	Production process can easily be changed to fit new product lines					
2	Firm is able to produce different products					

THANK YOU FOR YOUR PARTICIPATION

