FACTORS INFLUENCING ENVIRONMENTAL MANAGEMENT ACCOUNTING PRACTICES AMONG MANUFACTURING SMEs IN NAIROBI KENYA

By

KARIO CYNTHIA JOY

094039

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DECLARATION

I hereby declare that this project is my original unaided work and has not been previously presented for the award of a degree by this or any University. To the best of my knowledge, this project contains no material published or written by any other except where references have been made accordingly.

Signature: …….. Date: …….

Kario Cynthia Joy

Approved by:

Signature: …… Date: ……

Mr Fredrick Otieno

Lecturer, Strathmore University Business School

Strathmore University

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYNMS

ABC	Activity Based Costing
EA	Environmental Accounting
ECA	Environmental Cost Accounting
EIAs	Environmental Impact Assessments
EMA	Environmental Management Accounting
EMCA	Environmental Management and Coordination Act
EMS	Environmental Management Strategies
FCA	Full Cost Accounting
GDP	Gross Domestic Product
IAs	Annual Environmental audits
IFAC	International Federation of Accountants
IMA	Institute of Management Accountants
KAM	Kenya Association of Manufacturers
KNCPC	Kenya National Cleaner Production Centre
LCC	Lifecycle Costing
MEMA	Monetary Environmental Management Accounting
MFA	Material Flow Accounting
NEMA	National Environment Management Authority
PEMA	Physical Environmental Management Accounting
SMEs	Small and Medium-sized Enterprises
UNEP	United Nations Environmental Program
USEPA	United States Environmental Protection Agency

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Small and Medium Enterprises in developing countries have been the main economic growth drivers, hence they are very crucial to the nation's economic stability (Dalberg, 2011). In South Africa, Fatoki's (2012) study reports that its government dedicated the SME as a priority for reducing the unemployment rate which was around 24% in 2012 through job creation. In Kenya, the informal sector accounted for 81% of the total employment as at 2010 (KNBS, 2011).

Manufacturing firms are firms involved in the production of products using raw materials obtained from the environment, hence it is important for them to conserve the environment (Chopra, 2013). According to the Kenya Association of Manufacturers (KAM), manufacturing firms are categorized into 14 sectors, 12 of which are processers classified by the type of raw materials they import and products they manufacture (KAM, 2019). They further state that manufacturing accounts for 13% of the gross domestic product (GDP) of Kenya's industrial sector and that 80% of its members are based in Nairobi.

In Kenya as National Environment Management Authority (NEMA) indicates, large manufacturing firms are subjected by the law, The Environmental Management and Coordination Act (EMCA), (1999) to Environmental Impact Assessments (EIAs) and Annual Environmental audits (IAs). However, EMCA does not apply to SMEs despite them acquiring their raw materials from the environment and their huge role in the growth of developing countries' economy (NEMA, 1999).

Dalberg (2011) concluded that the business environment in the SMEs sector is dynamic in terms of technology and risk hence more efficient business-oriented management planning is required. This leads to proper resource allocation, use and management. The adoption of modern management techniques that include environmental management accounting, if well utilized, result in efficient operations and expansive end results such as meeting corporate strategies, corporate social responsibility and environmental performance. Through such benefits, SMEs are the backward and forward linkages for products and services previously not provided by large enterprises and therefore enabling the Government of Kenya to achieve the intended industrialized economy known as the Vision 2030 (Kithae & Gakure, 2012).

1.1.1. Environmental Management Accounting Practices

According to Chang (2007), accounting has faced the challenge of accounting for the environment not only through its traditional way of financial reporting, but also through its role in managing environmental performance. Environmental accounting, a field in accounting, developed over time to mitigate this challenge. Bartolomeo et al. (2000) defines environmental accounting as a field that provides both internal and external stakeholders information on the relevant firm's environmental performance. Environmental management accounting (EMA) is a subset of environmental accounting and not separate from the conventional management accounting. It provides useful information to firms to manage and improve environmental performance and reduce environmental impacts (International Federation of Accountants, 2005).

Some of the perceived limitations of conventional management accounting are due to environmental costs being allocated to overhead costs leading to the costs being invisible as Burritt (2004) found and in some cases, the organization fails to attribute any form of environmental costs to its operations (Deegan, Australia, & Authority, 2003). Therefore, the presence of these limitations has led to opportunities to reduce environmental costs and improve environmental performance being lost.

Through EMA, there has been increased recognition in that focus has shifted from the conventional management accounting way of providing financial information to the reduction of resource consumption and efficient use of natural resources as explained by (International Federation of Accountants, 2005). Therefore, the practice of EMA in a firm is necessary to restore the environment from which a firm obtains its raw materials.

1.1.2. Small and Medium Manufacturing Enterprises

Small and Medium Enterprises (SMEs) are classified differently in various countries. In Kenya, they are classified by the number of full-time employees they have as the Government of Kenya's 1993 Development Plan and the Sessional Paper No 2 of 2005 defines. Those employing less than five are micro, between 5 to 49 employees are small and from 50 to 99 are medium enterprises (Government of Kenya, Sessional Paper, 2005) (Government of Kenya, National Development Plan, 1993).

Given that manufacturing SMEs are not required by EMCA to do any Environmental Impact Assessments and Annual Environmental audits, it is important to see if they consider it necessary to internally manage their environment. EMA practice in manufacturing SMEs has

not received much attention from researchers (Lee, 2009). Hence, this leaves a significant gap in researches on environmental management accounting practices in manufacturing SMEs.

1.2 Problem Statement

An ideal state in terms of environmental management accounting would be where the management of manufacturing SMEs in Nairobi, Kenya consider all physical and monetary environmental costs and account for them appropriately. However, currently NEMA (1999) does not require them to do environmental impact assessments and environmental audits. Lack of means there is no pressure on them to take care of the environment leading to a lot of pollution and waste mismanagement. Kenya National Cleaner Production Centre (KNCPC) has the mandate of ensuring reduction of pollution in Kenya and cleaner rivers as well as adoption of cleaner production processes through environmental accounting (Mwirigi, 2007).

The society is unable to be sustainable for development due to unnecessary pollution (NEMA, 1999). Other businesses are unable to find resources if they are mismanaged by manufacturing SMEs. Profitability of firms is decreased as they must individually deal with the negative externalities each produces. The need for wealth generation will lead many companies into adopting EMA practices as supported by (UNEP, 2014). The problem which motivates this study is based on the following premises. Firstly, few empirical studies on environmental management accounting are based on developing countries specifically Kenya. Secondly, the few empirical studies on factors influencing EMA practices are studied among publicly listed firms and not SMEs like (Mumbi, 2014). Lastly, the methodologies used are different, that is, this study focuses on coercive, normative and mimetic pressures as factors influencing EMA practice among manufacturing SMEs in Nairobi, Kenya.

1.3 Research Objectives

The general research objective of this study was to establish the level of adoption of EMA practices and to determine factors influencing such practices among manufacturing SMEs in Nairobi, Kenya. The specific objectives were as follows:

i To establish coercive factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya.

ii To assess normative factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya.

iii To determine mimetic factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya.

1.4 Research Questions

This study sought to answer the following questions:

i. What are the coercive factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya?
ii. What are the normative factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya?
iii. What are the mimetic factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya?

1.5 Significance of the study

The study is of significance to following parties:

Managers of Manufacturing SMEs

This study will help these managers know what factors will influence their EMA practices and to what extents. Knowledge of such will lead to better decision making and costs savings hence better profits.

Environmental Regulatory Bodies

The Government of Kenya, local governments and environmental regulatory bodies (NEMA) will find this study beneficial as they will know the EMA practices adopted by SMEs and how they can influence better environmental conservation.

Future Researchers

They will find this research helpful as it will provide more empirical literature to use in their research. They will also be able to find knowledge gaps from this study to research on.

1.6 Scope of the study

As NEMA (1999) does not apply to manufacturing SMEs in Kenya, this study's scope is manufacturing SMEs. Manufacturing firms tend to be active users of EMA due to the nature of their operations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter expounds on the literature under the subject of study. It focuses on theories of environmental management accounting in detail as well as an empirical review of previous studies on the same subject and a conceptual framework of this study.

2.2 Theoretical Review

Some of the theories that inform this study are as follows:

2.2.1 Stakeholder Theory

This theory suggests that every organization has unique stakeholders who influence its actions and are accordingly affected by such actions. Stakeholders are parties that are directly or indirectly affected by an organization's actions and can be one of the following: employees, customers, suppliers, competitors, shareholders, government, media, regulatory bodies and society as a whole (Naila, 2011).

Manufacturing firms owe their stakeholders a role of taking care of the environment from which they obtain raw materials (Buysse & Verbeke, 2003). Therefore, manufacturing SMEs were expected to be involved in a few EMA practices to conserve the environment.

2.2.2 Institutional Theory

This theoretical perspective considers extra-organizational institutions (social, economic and political) that affect an organization's practice. It explores factors influencing EMA adoption (Chang, 2007). DiMaggio and Powell (1983) explained an important concept, isomorphism, as a constraining process that forces a unit in a population to resemble other units that face the same set of environmental conditions. There are three ways through which institutional isomorphism changes can occur: coercive, normative and mimetic pressures. Coercive pressures occur due to political influences on the organization's adherence to existing legislation. Mimetic pressures stem from the responses of a firm to practices of competing firms in uncertain situations. Normative pressures occur due to professionalism when a firm voluntarily adopts actions to deal with coercive pressures (DiMaggio & Powell, 1983) The above pressures were the basis of factors in this study as all manufacturing SMEs in Nairobi, Kenya face the same set of environmental conditions.

2.3 Empirical Review

The following subsections discuss previous studies findings in coordination with this study's objectives.

2.3.1 The Concept of Environmental Management Accounting

The primary purpose of EMA is to provide internal decision support for the management of both financial and environmental performance and consider both the monetary and physical aspects of environmental accounting. Through identifying monetary and physical information, monetary environmental management accounting (MEMA) and physical environmental management accounting (PEMA) are established. (Chang, 2007)

MEMA continues the conventional management accounting way of dealing with environmental aspects that are expressed in monetary units. It focuses on financial aspects of an organization's activities that impact the environment and its management leads to improvement in environmental performance. Information acquired under MEMA would be monetary cost to acquire materials, labour and cost that controls environmental damages. PEMA is an internal management tool that deals with an organization's environmental impacts expressed in physical units to ensure eco-efficiency. Some of the physical information collected include flow of energy, water, materials and waste. Such information leads to identification of many environmental costs.(Chang, 2007; Gunarathne & Lee, 2015)

The United States Environmental Protection Agency (USEPA) (1995b, p9) environmental cost scheme categorises environmental costs on how it is measured. The environmental cost scheme is as follows:

Table 2.1: The USEPA Environmental Cost Scheme

Tiers	Spectrum	Examples
Tier 1	Conventional Costs	Includes cost of direct raw materials, utilities, labour, supplies, capital equipment and related depreciation.
Tier 2	Hidden Costs	Includes upfront costs to find environmentally conscious suppliers, regulatory costs to monitor and voluntary costs to financially support groups.
Tier 3	Contingent Cost	Involves future compliance costs or legal expenses.

Tier 4	Relationship/Image Costs	Hard to determine and separately identify but include corporate relationship cost with the stakeholders of the organization.
Tier 5	Societal Costs	Environmental damage caused by a firm for which it is not accountable.

Source: Modified from USEPA (1995b, p9); Chang, (2007); Deegan et al. (2003)

Tier 1-4 are considered private costs or internal costs which have direct impact to an organisation while the last tier is an external cost an organization incurs without being legally held accountable for. For organizations starting to adopt EMA, only private costs were considered. Deegan et al. (2003) suggests that in the early stages of implementing an EMA system, environmental costs scope should be limited to a manageable number. Therefore, only conventional costs, tier 1, were considered in this study as manufacturing SMEs in Nairobi, Kenya are still new to EMA practices. The study was limited to costs of direct raw materials, labour and waste generated as supported by (Chang, 2007).

Some of the environmental costing approaches used in EMA include: activity-based costing (ABC), full cost accounting (FCA), life cycle costing (LCC) and material flow accounting (MFA) (Burritt, 2004; Qian, Burritt, & Monroe, 2011). Activity based costing involves identifying the environmental cost drivers and respectively allocating cost to them. It is one of the best tools in EMA and most accountants are familiar with it (Horngren et al., 2010). Full cost accounting accounts for both internal and external costs hence not suitable for organizations starting to implement EMA (Chang, 2007). Life cycle costing as explained by USEPA (1995b) is related life cycle analysis and the cost of a product from the research and development to its final disposal. Material flow accounting or energy and material accounting identifies physical environmental costs and is appropriate for organizations with more than 20 percent of material costs to overall operating costs (Bartolomeo et al., 2000).

2.3.2 Adoption of EMA practices

Mumbi (2014) confirms that there is no standardized way to determine the level of EMA adoption among manufacturing SMEs, but certain aspects can characterize it. Firstly, any organization using EMA must be able to identify and measure environmental costs appropriately (Debnath, 2014). Environmental costs must be clearly separated from general overhead costs.

As Jalaludin, Sulaiman, and Nazli Nik Ahmad (2011) explain in their research, the level of adoption is determined by the methods used to account for environmental costs and the extent of their use. Such methods include activity-based costing, full cost accounting, life cycle costing and material flow accounting (Chang, 2007). Previous studies have shown that the adoption of EMA practices is not homogenous within the manufacturing industry. Some companies adopt reactive environmental strategies that use limited resources to fulfil legal requirements only as Qian and Burritt's (2009) study explained while others adopt proactive environmental strategies that involve high levels of EMA adoption and high resources utilization (Buysse & Verbeke, 2003).

Mumbi (2014) used the Institute of Management Accountants (IMA) (1996) explanation on the EMA practices that can be adopted based on the costing, investment and performance evaluation decisions to determine level of EMA adoption. To identify the level of adoption that a manufacturing SME in Nairobi, Kenya is in, the table below explains the implementation of EMA as per the decisions it addresses at the managerial level.

Table 2.2: The levels of adoption of EMA practices

Level of adoption	**Intensity**	**Decisions**
Stage 1	Low levels of adoption	Costing Decisions
Stage 2	Moderate levels of adoption	Investment Decisions
Stage 3	High levels of adoption	Performance Evaluation Decisions

Source: Modified from IMA (1996)

The costing decision is mostly involved with regulatory compliance by monitoring identified environmental costs that may be incurred due to not abiding by the environmental laws. The investment decisions acknowledge that environmental management leads to a company's competitive advantage hence managers manage environmental costs identified in stage 1 to reduce pollution and use resources efficiently. Lastly, managers making performance evaluation decisions know that environmental performance can be a key contributor to economic growth and firm profitability hence they also include costing and investment decisions as Mumbi (2014) explained. Jalaludin et al. (2011) adopted the same method of determining level of adoption in their study excluding the performance evaluation decisions but on a weighted scale unlike Mumbi (2014). The following table shows the techniques

derived from decisions in table 2.2 and environmental costing methods as IMA (1996) described.

Table 2.3: EMA techniques

Method description	EMA practices
Costing decisions	Allocation of environmental costs to production activities responsible for those costs
	Identification of environment related expenditures
	Estimation of a product's environmental costs to determine its selling price
	Quantification of a product's environmental costs over its life
	Analysing physical flows of materials and energy moving through the production system
	Creation of environmental cost accounts
Investment decisions	Inclusion of environmental costs in investment appraisals
	Estimating long term and short-term effects of a company project on its location's environment
Performance evaluation decisions	Estimating potential environmental contingencies
	Identification of opportunities for reducing environmental impacts caused by products
	Conducting environmental management training programs for employees
	Incorporating environmental goals into business strategy

Source: Modified from IMA (1996); Schaltegger & Burritt (2000); Mumbi (2014)

This study used the Schaltegger & Burritt's (2000) checklist to measure the level of EMA adoption.

2.3.3 Factors influencing practice of EMA

Manufacturing firms are continuously producing hence they are most likely involved in the practice of EMA. However, that does not mean that non-manufacturing firms do not practice EMA. In Chang's (2007) study, the Australian Universities practiced low levels of EMA due to poor knowledge of the environmental costs they incurred while Chang, (2013), a similar study on the Taiwan Universities showed that the universities used EMA to identify environmental costs. Qian et al. (2011) conducted a similar study on local government institutions and found that the level of EMA implementation was low.

A few studies were conducted on developing countries. Jalaludin et al. (2011) conducted a research in manufacturing companies in Malaysia on the relationship between institutional pressure and EMA adoption. The results were that institutional pressure especially normative pressure was more forceful on adoption of EMA. Another research paper was conducted on Malaysian small and medium manufacturing firms to investigate on factors and barriers which influence the practice of EMA. The findings were that most firms had a budget allocation for environmental activities, practiced physical EMA and coercive factors were dominant (Jamil, Mohamed, Muhammad, & Ali, 2015). A research paper conducted in Nigeria and South Africa on their listed manufacturing firms showed that high levels of EMA practices were employed in South Africa than in Nigeria (Iredele & Ogunleye, 2018).

For a more local perspective, Mumbi (2014) conducted a study on the factors influencing adoption of EMA practices among manufacturing firms in Nairobi, Kenya. The study used surveys and tested the factors using simple and multiple regression analysis. The findings were that the costs of compliance, the environmental strategies employed, and the organization's financial performance were able to explain the variability in the levels of adoption of EMA practices. Some of the factors investigated were; regulatory compliance, size of the company, level of manufacturing technology, age, environmental strategy and financial performance.

Jamil et al. (2015) developed factors from coercive, normative and mimetic pressures to use as factors influencing the practice of EMA in Malaysian manufacturing SMEs on a weighted scale. This study employed a similar method to determine factors influencing EMA practices in manufacturing SMEs in Nairobi, Kenya as illustrated in the table below.

Table 2.4: Factors influencing EMA practices

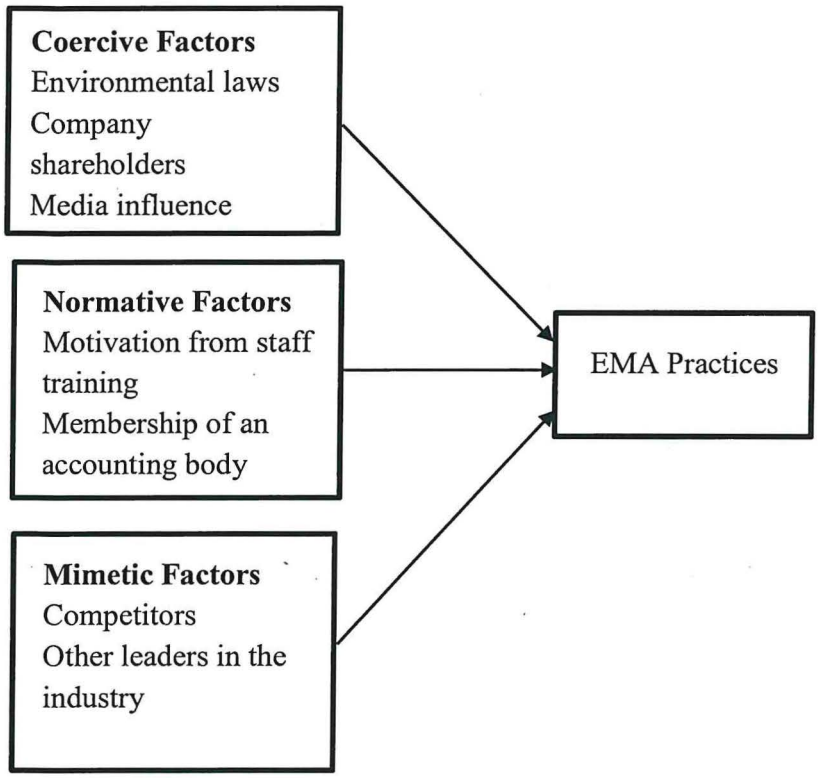
Type of factor	**Examples**
Coercive factors	Environmental laws such as the EMCA (1999) and regulations by NEMA
	Company shareholders requiring environmental management for company growth
	Media influencing EMA practices
Normative factors	Motivation from staff training on environmental management programs
	Membership of an accounting body requiring environmental management
	Competitors being highly involved in EMA practices

Mimetic factors	Other leaders in the industry practicing EMA highly

Source: Author (2019); Jamil et al. (2015)

2.4 Conceptual Framework

A conceptual framework is an important item in any research study as it shows the relationship between independent variables and dependent variables. In this study, the independent variables are the coercive factors, normative factors and mimetic factors. The dependent factor is EMA practices. The following figure explains more:



Source: Author (2019)

Figure 2.1: Conceptual Framework

2.5 Research Gaps

Mumbi (2014) examined factors influencing the level of EMA practices adoption not the factors influencing the practice of EMA. This study investigates the levels of EMA practices adoption and the factors influencing EMA practices among manufacturing SMEs in Nairobi, Kenya as the above paper conducted the research on manufacturing firm of all sizes.

2.6 Summary

Previous research studies have discussed EMA practice extensively. To ensure efficient use of scarce resources and better management of the environment, environmental regulatory bodies

such as NEMA in Kenya try to ensure manufacturing companies abide by their regulations concerning conservation of the environment and its resources. This study sought to determine levels of EMA practices adoption among manufacturing SMEs in Nairobi, Kenya and factors influencing such practices.

CHAPTER THREE

RESEARCH METHODOLGY

3.1 Introduction

This chapter addresses the methodology and procedures adopted by the researcher in conducting the research successfully. The chapter is organized into the following sections: research design, target population, sample and sample frame, data collection instrument and procedure, data reliability and validity, data processing and analysis and finally ethical considerations.

3.2 Research design

Saunders, Lewis, & Thornhill (2009) explain a research design as a general plan on how one will go about their clearly stated research objectives formulated from research questions. To establish the level of EMA practices adopted among manufacturing SMEs in Nairobi, Kenya, the descriptive research design was used. To assess the factors influencing the practice of EMA among manufacturing SMEs in Nairobi, Kenya, an explanatory research design was used. Both descriptive and explanatory research designs were used to increase the depth of the study. A descriptive research portrays an accurate profile of a phenomena or situation while an explanatory research studies a situation to explain the relationship between variables hence a descriptive research is a precursor to an explanatory research (Saunders et al., 2009). It was done at a singular point in time due to time constraints of the researcher, therefore it was a cross-sectional based study (Saunders et al., 2009). This method was adopted by the following researchers too (Mumbi, 2014; Jalaludin et al., 2011; Jamil et al., 2015).

3.3 Target population

This study targeted manufacturing SMEs in Nairobi, Kenya in the 12 sectors under manufacturing. According to KAM (2011), 455 of the 700 members operate in Nairobi based mainly in industrial area with a few spreading all over. There was no directory of manufacturing SMEs in Nairobi hence no population could be obtained. The individual respondents were made up of production managers where applicable and accountants in this manufacturing SMEs.

3.4 Sample and sample frame

Due to time constraints and lack of a directory of manufacturing SMEs, the researcher settled on non-probability sampling methods. This meant that statistical inferences could not be made.

The researcher used purposive sampling where samples selected provided more information from a small sample to answer the research questions (Saunders et al., 2009). The sample size was 30 manufacturing SMEs. The respondents were selected based on the researcher's convenience.

3.5 Data Collection Instrument and Procedure

This study used the survey strategy where what, who, where and how questions are answered (Saunders et al., 2009). The survey strategy allows collection of a large amount of data from a sizeable population in an economical way by use of questionnaires for ease of comparison (Saunders et al., 2009). A questionnaire was used to collect primary data from the target population including both qualitative and quantitative data. The first section of the questionnaire had questions relating to the firm's specific background information. The second section contained questions on EMA practices of the target population in terms of level of adoption and influencing factors.

According to Djamba & Neuman (2002), the response rate of questionnaires is on average 9-10%. For a better response rate, the questionnaires were self-administered by the researcher on visiting the manufacturing SMEs being targeted.

3.6 Data Reliability and Validity

For a research to be acceptable and not questioned, its reliability and validity must be assured. According to Saunders et al. (2009), reliability refers to what extent the data collection techniques used in a study are consistent to its findings. For this study to be reliable, the questions in the questionnaire were clear and well defined to reduce confusion.

Validity is ensuring that the findings are really about what they appear to be (Saunders et al., 2009). Validity was ensured by asking relevant questions concerning levels of EMA practices adoption and factors influencing practice of EMA among targeted manufacturing SMEs.

3.7 Data Processing and Analysis

To fulfil the first objective, a score of 1 was placed on the stated EMA methods adopted as stated in section two of the questionnaire. A value of 0 was placed on those methods not adopted by an organization. The total number of practices adopted by each entity was divided by total number of methods stated to establish level of EMA adoption through frequency distribution and percentages.

To fulfil the second objective, responses to the second section of the questionnaire were coded and transferred to a statistical software package for in-depth analysis. Descriptive statistics analysis and multiple regression analysis were used to analyse the influencing factors in the statistical package for social sciences (SPSS) and Microsoft Excel were used.

The regression equation from the factors is as follows:

$$Y = a + bX1 + cX2 + dX3 + eX4 + fX5 + gX6 + hX7 + e$$

no diagnostic tests

Where:

Y=EMA practices in place

X1=Environmental Laws

X2=Company shareholders

X3=Media influence

X4=Motivation from staff training

X5=Membership of an accounting body

X6=Competitors

X7=Other leaders in the industry

e= error term

a= autonomous practice of EMA

3.8 Ethical Consideration

This study's conduct was guided by Strathmore University's code of ethics and permission to carry out the research was granted by the university. Participation in the research was voluntary and withdrawal at any point was allowed. Privacy of the participants was highly maintained as well as clarification of the details of the study. Data obtained was confidential and was not used for any other purpose other than for the research objectives stated in the first chapter.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents the data analysis from the results of the study. The data results are summarized using descriptive statistics and multiple regression analysis.

4.2 Summary of the findings obtained from the survey

4.1 The subsectors of the participant manufacturing SMEs

The researcher received 16 responses from the 30 potential sample respondents. The response rate was 53% and low as expected and described by (Mumbi, 2014). Most SMEs were not willing to disclose information and EMA is fairly a new topic. Only 8 out of the 12 subsectors participated in the research. Potential respondents from Leather and Footwear, Automotive, Plastics and Rubber and Pharmaceutical and Medical Equipment subsectors did not participate.

25% of the responses were from the building, mining and construction subsector. 12.50% were from food and beverages, energy, electrical and electronics, chemical and allied, paper and board and textiles and apparel subsectors singularly. The rest two subsectors were 6.25% of subsectors individually as shown in Table 4.1.

Table 4.1: Subsectors of the manufacturing industry

Valid Sectors	Frequency	Percent	Cumulative Percent
Food & Beverages	2	12.50%	12.50%
Building, Mining & Construction	4	25.00%	37.50%
Energy, Electrical & Electronics	2	12.50%	50.00%
Chemical & Allied	2	12.50%	62.50%
Paper & Board	2	12.50%	75.00%
Textiles & Apparel	2	12.50%	87.50%
Timber, Wood & Furniture	1	6.25%	93.75%
Metal & Allied	1	6.25%	100%
Total	16	100%	

4.2 Duration of the firm's existence

The respondents were asked to indicate the number of years the SME had been in existence. This was important to relate the duration of existence to the level of adoption of EMA practices. The research shows that most of SMEs were below 5 years (43.75). The results are presented in figure 4.1.

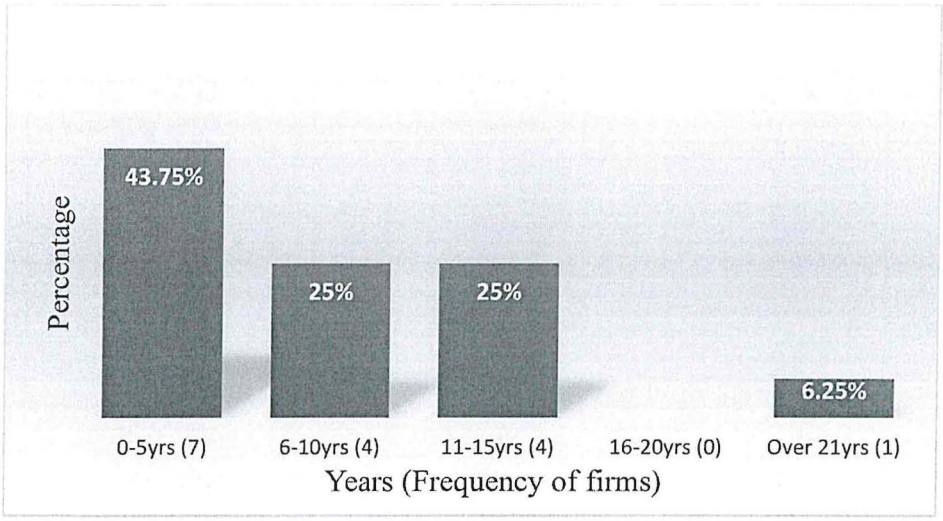


Figure 4.1: Duration of the firm's existence

4.3 Classification of the SMEs

This section sought to determine the size of the respondents based on the number of employees they stated to have. Employees less than 5 represents micro, between 5 to 49 small, 50 to 99 medium and above 100 represent large. Most of the respondents in this study were medium SMEs representing 62.5% of the research. The results are as shown in figure 4.2.

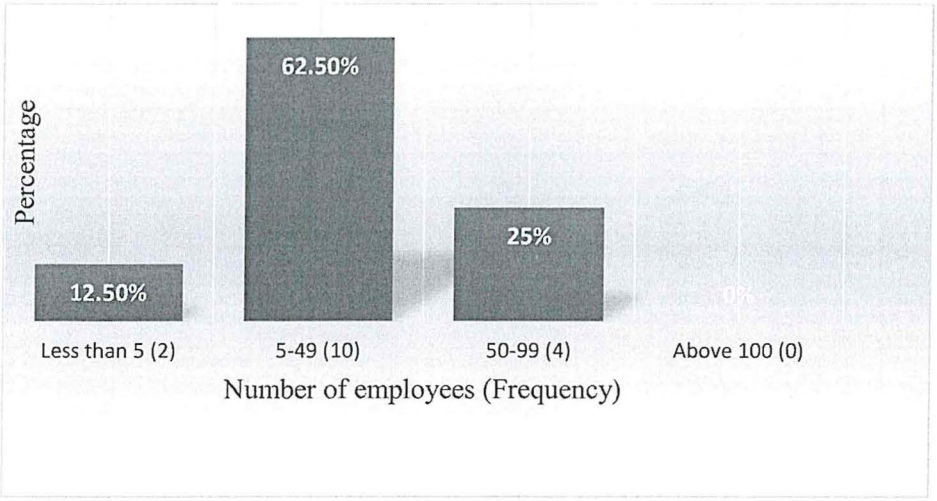


Figure 4.2: Number of employees

4.4 Level of adoption of EMA practices

A checklist containing 12 accepted EMA practices as identified in prior literature was used to calculate a percentage based on the number of EMA practices adopted by the respondents. There are 12 practices, and each will be given a weight of 1/12. This method was used in previous studies (Jalaludin et al., 2011) (Mumbi, 2014).

Table 4.2: Levels of adoption of EMA practices

Stages of Adoption	Methods	N	Percent	Percent of Cases
Stage 1 Low levels of adoption	Allocation of environmental costs to production activities responsible for those costs	9	9.3%	56.3%
	Identification of environment related expenditures	13	13.4%	81.3%
	Estimation of a product's environmental costs to determine its selling price	8	8.2%	50%
	Quantification of a product's environmental costs over its life	4	4.1%	25%
	Analysing physical flows of materials and energy moving through the production system	10	10.3%	62.5%
	Creation of environmental cost accounts	3	3.1%	18.8%
Stage 2 Moderate Levels of adoption	Inclusion of environmental costs in investment appraisals	9	9.3%	56.3%
	Estimating long term and short-term effects of a company project on its location's environment	6	6.2%	37.5%
Stage 3 High Levels of adoption	Estimating potential environmental contingencies	6	6.2%	37.5%
	Identification of opportunities for reducing environmental impacts caused by products	13	13.4%	81.3%
	Conducting environmental management training programs for employees	4	4.1%	25%
	Incorporating environmental goals into business strategy	12	12.4%	75%

From the above table, 81.3% of manufacturing SMEs identify environment related expenditures and identify opportunities for reducing environmental impacts caused by products.

4.5 Factors influencing EMA practices

This section sought to determine factors influencing the practice of EMA. A five-point Likert scale was used to interpret the results whereby, the scores are represented as follows: 1≤Disagree≥2.5, 2.6≤Neutral≥3.5 and 3.6≤Agree≥5.0.

Table 4.3: Factors influencing EMA practices

Factor		Mean	Std Deviation	Min	Max
Coercive	Environmental laws such as the EMCA (1999) and regulations by NEMA	4.25	0.5773503	3	5
	Company shareholders requiring environmental management for company growth	3.9375	0.771902	3	5
	Media influencing EMA practices	3.6875	1.078193	1	5
Normative	Motivation from staff training on environmental management programs	3.1875	1.682013	1	5
	Membership of an accounting body requiring environmental management	2.4375	1.314978	1	5
Mimetic	Competitors being highly involved in EMA practices	3.5625	1.263263	1	5
	Other leaders in the industry practicing EMA highly	3.5625	1.263263	1	5

As shown in the table above, environmental laws largely influence EMA practices adopted by manufacturing SMEs in Nairobi, Kenya by a mean of 4.25. Membership of an accounting body is the least influencing factor by a mean of 2.4375.

Table 4.4: Overall descriptive statistics

Factors	Mean	Std Deviation	Min	Max
Coercive	3.958333	0.122613	1	5
Normative	2.8125	0.27104	1	5
Mimetic	3.5625	0.219684	1	5

As it can be seen from the above table, coercive factors have the highest mean (3.95833), followed by mimetic factors (3.5625) and lastly normative factors (2.8125).

4.6 Regression analysis

A multiple regression analysis was conducted using SPSS. All variables were entered in the model for analysis. Table 4.5 – 4.7 show the results for this research on factors influencing EMA practices. As shown in Table 4.5 below, the factors (independent variables) had an overall effect on EMA practices of R=.720 and an R^2 value of .519 which suggest that the factors used in the model accounted for 51.9% of the variance in EMA practices.

Table 4.5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.720[a]	0.519	0.098	0.948

a. Predictors: (Constant), Environmental Laws, Company Shareholders, Media, Motivation, Membership, Competitors and Other leaders

Table 4.6: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.751	7	1.107	1.233	.385[b]
	Residual	7.186	8	0.898		
	Total	14.938	15			

a. Dependent Variable: EMA practices

b. Predictors: (Constant), Environmental Laws, Company Shareholders, Media, Motivation, Membership, Competitors and Other leaders

Table 4.5 above shows the ANOVA results. As shown by the sum of squares, the regression model explained more of the influence in the model (regression SS = 7.751, residual SS = 7.186). The model itself was significant in explaining factors influencing EMA practices (F=1.233, sig=.385).

Table 4.7: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.
		B	Std. Error			
1	(Constant)	4.170	3.228		1.292	0.232
	Environmental laws	0.063	0.493	0.036	0.128	0.902
	Company Shareholders	-0.197	0.384	-0.152	-0.513	0.622
	Media Influence	-0.147	0.323	-0.159	-0.456	0.661
	Motivation	0.374	0.204	0.631	1.832	0.104
	Membership	0.039	0.239	0.051	0.161	0.876
	Competitors	0.504	0.252	0.637	2.002	0.080
	Other Leaders	-0.038	0.282	-0.048	-0.136	0.895

a. Dependent Variable: EMA practices

The regression equation is as follows:

$$\mathbf{Y=4.170+0.063X_1-0.197X_2-0.197X_3+0.374X_4+0.039X_5+0.504X_6-0.038X_7+e}$$

From the table above, at a 5% level of confidence, no factor is significant in fully influencing EMA practices individually as all their significances are above 0.05 as seen in the last column. All the factors considered in this study and more that were not considered, influence EMA practices of a manufacturing SME wholly.

When all factors influencing EMA practices are 0, the level of EMA practices in place would be 4.170. This means without the influence of the coercive, normative and mimetic factors, the EMA practices in place would increase by 4.17% indicating that the above factors are not the sole items affecting the practice of EMA.

CHAPTER FIVE

DISCUSSION AND FINDINGS

5.1 Introduction

This chapter discusses findings from the research and gives a summary of the conclusions derived from the analysis of the findings in relation to the research objectives.

5.2 Discussion of the findings

5.2.1 The levels of EMA practices adoption among manufacturing SMEs

This study sought to answer three research questions. However, before answering the research questions of factors influencing EMA practices among manufacturing SMEs, the levels of EMA practices in place had to be determined. The findings show that 81.3% of the manufacturing SMEs have adopted EMA practices to some extent in the first stage where they identify environment related expenditures as supported by (Mumbi, 2014). Most manufacturing SMEs are involved in the first stage of EMA where they apply Environmental Costing Accounting (ECA), known as costing analysis.

IMA (1996) assert that EMA practices that fall in the first stage as shown in Table 2.2 can only be used to make costing decisions. Manufacturing SMEs that apply EMA practices in stage one only do so to manage environmental laws compliance as prior literature suggest (Buysse & Verbeke, 2003). 56.3% of the manufacturing SMEs include environmental costs in their investment appraisals. The observations made regarding levels of EMA practices adoption from this research show that most manufacturing SMEs practice EMA to meet the environmental laws in place. This is like what Mumbi (2014) observed.

5.2.2 Factors influencing EMA practices

This study sought to answer three research questions. The researcher grouped the factors influencing EMA practices into three categories: coercive, normative and mimetic factors. Each research question was formed from one of the three categories. Further seven individual factors were formed as shown in Table 2.4. From the findings of the research, the factors that highly influence EMA practices among manufacturing SMEs in Nairobi, Kenya are coercive, followed by mimetic and lastly normative factors as shown in Table 4.4. This is obtained from the descriptive statistics analysis, a method also used by (Jamil et al., 2015) (Jalaludin et al., 2011).

Jamil et al. (2015) reported that the order of factors influencing EMA practices in Malaysia starting from the highest to the lowest is as follows: coercive, normative and mimetic factors.

This is in contradiction with this research paper due to the different contexts in which both papers were conducted in. Jalaludin et al. (2011) reported that mimetic, coercive and normative factors influence EMA practices in that order from the highest to the lowest. This is also in contradiction to the findings of this study due to different circumstances such as different locations and times. However, results from the three papers are in line with institutional theory as supported by (Jamil et al., 2015).

Using the regression analysis, this study shows that there is no significant relationship between the seven individual factors in Table 2.4 and EMA practices. This is not in tandem with results from Mumbi's (2014) study that showed regulatory compliance has significant relationship with EMA practices. Jalaludin et al. (2011) shows that only normative factors have a significant relationship with EMA practices while Jamil et al. (2015) show that only coercive factors have a significant relationship with EMA practices. This study is inconsistent with results from the two papers as neither of the three categories of factors has a significant influence on EMA practices. All the differences in results among the above papers are due to differences in contexts under which the studies are conducted.

5.3 Conclusions

As coercive pressures on manufacturing SMEs in Nairobi, Kenya increase, more SMEs are willing to practice EMA as shown in Table 4.4. Institutional theory asserts that coercive pressures exerted on manufacturing SMEs in relation to EMA practices by the government compels the SMEs to make changes and adopt certain attributes to comply with the environmental regulations (Chang, 2007) (Chang, 2013) (Jamil et al., 2015). The manufacturing SMEs will not adopt EMA without pressure from the government (Jamil et al., 2015). Therefore, the government needs to increase coercive pressure on practice of EMA among manufacturing SMEs in Nairobi, Kenya.

5.4 Recommendations

The adoption of EMA and factors influencing it should be examined in other industries like universities, hospitals and financial institutions. In Nairobi, further research into the waste management practices should be done. Further research should be done on how coercive, normative and mimetic pressures influence the financial performance of manufacturing SMEs. A more holistic approach a similar study would provide more answers.

5.5 Limitations of the study

This study was a cross-sectional study due to time constraints hence a limitation on its scope. There is no specific directory for manufacturing SMEs in Nairobi, Kenya hence a population could not be obtained. The researcher was unable to obtain responses from 4 subsectors being: Leather and footwear, Plastic and Rubber, Automotive and Pharmaceutical and Medical Equipment. Lastly, other possible factors influencing the practice of EMA were not considered such as location.

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APPENDICES

Appendix 1: Sectors within Kenya's manufacturing industry

Food & Beverages	Textiles & Apparel
Building, Mining & Construction	Timber, Wood & Furniture
Energy, Electrical & Electronics	Metal & Allied
Chemical & Allied	Plastics & Rubber
Paper & Board	Pharmaceutical & Medical Equipment
Leather & Footwear	Automotive

Source: Kenya Association of Manufacturers

Appendix 2: Classification of Manufacturing Companies in Kenya based on size

Class	Number of employees
A	5-19
B	20-49
C	50-99
D	100-199
E	200-499
F	Over 500

Source: Kenya Directory of Manufacturers Industries, 3rd Ed. 1997

Appendix 3: EMA techniques

Method or practice applied
Allocation of environmental costs to production activities responsible for those costs
Identification of environment related expenditures
Estimation of a product's environmental costs to determine its selling price
Quantification of a product's environmental costs over its life
Analysing physical flows of materials and energy moving through the production system
Creation of environmental cost accounts
Inclusion of environmental costs in investment appraisals
Estimating long term and short-term effects of a company project on its location's environment
Estimating potential environmental contingencies

Identification of opportunities for reducing environmental impacts caused by products
Conducting environmental management training programs for employees
Incorporating environmental goals into business strategy

Source: Modified from IMA (1996); Schaltegger & Burritt (2000); Mumbi (2014)

Appendix 4: Questionnaire

Section A: Background Information

1. Name of the organization:
2. How long has the organization been in existence:

   0-5 years [ ] 16-20 years [ ]

   6-10 years [ ] Over 21 years [ ]

   11-15 years [ ]
3. What sector in the manufacturing industry does the organization fall under? Tick where appropriate.

	Food & Beverages		Textiles & Apparel
	Building, Mining & Construction		Timber, Wood & Furniture
	Energy, Electrical & Electronics		Metal & Allied
	Chemical & Allied		Plastics & Rubber
	Paper & Board		Pharmaceutical & Medical Equipment
	Leather & Footwear		Automotive

4. How many employees work in this organization?

   Less than 5 [ ]

   5-49 [ ]

   50-99 [ ]

   Above 100 [ ]

Section B: This section seeks to identify levels of adoption of Environmental Management Accounting (EMA) practices and the factors influencing its practice.

5. Listed in the table below are some of the techniques used in EMA that qualify for EMA practices. Kindly tick the method/ methods used by the company.

Method or practice applied	√
Allocation of environmental costs to production activities responsible for those costs	

Identification of environment related expenditures	
Estimation of a product's environmental costs to determine its selling price	
Quantification of a product's environmental costs over its life	
Analysing physical flows of materials and energy moving through the production system	
Creation of environmental cost accounts	
Inclusion of environmental costs in investment appraisals	
Estimating long term and short-term effects of a company project on its location's environment	
Estimating potential environmental contingencies	
Identification of opportunities for reducing environmental impacts caused by products	
Conducting environmental management training programs for employees	
Incorporating environmental goals into business strategy	
Others? (Specify)	

6. The table below lists some of the factors that influence the practice of EMA practices. Kindly rate each of the following factors on a scale of 1 to 5 where:

   Strongly agree (5) Agree (4) Neutral (3) Disagree(2) Strongly disagree (1)

Influencing Factors	1	2	3	4	5
Environmental laws such as the EMCA (1999) and regulations by NEMA influence the practice of EMA					
Company shareholders requiring environmental management for company growth influence practice of EMA					
Media influencing EMA practices either positively or negatively					
Motivation from staff training on environmental management programs influences practice of EMA					
Membership of an accounting body requiring environmental management influences practice of EMA					

Competitors being highly involved in EMA practices influence practice of EMA					
Other leaders in the industry practicing EMA highly influence practice of EMA					
Others? (Specify)					

THANK YOU FOR YOUR PARTICIPATION

Appendix 5: List of respondents

Subsectors	**Manufacturing SMEs**
Energy, Electrical & Electronics	Alfa Engineers Ltd
	Modern Coast Group
Textiles & Apparel	Tikoo & Co Ltd
	Brand Me Kenya
Chemical & Allied	Saru Organics
	Em Technologies Ltd
Food & Beverages	Mill Bakers Ltd
	Dream Logistic Company Ltd
Metal & Allied	Magnum Eng& Gen Cont. Ltd
Paper & Board	Attiq Yomin Designsland
	Print Plus Kenya
Timber, Wood & Furniture	Habibani Hardware
Building, Mining & Construction	Fesrock Ltd
	Cajma Pavings Ltd
	Anole Construction Co.
	Dido and Sons Ltd

Ole Sangale Rd, Madaraka Estate
P. O Box 59857 - 00200, Nairobi, Kenya.
Cell: +254 (0) 703 034 414/6/7,
Twitter: @SBSKenya
LinkedIn/ Facebook: Strathmore Business School

Email: **info@sbs.ac.ke** or visit **www.sbs.strathmore.edu**

Strathmore UNIVERSITY
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17 October 2019

To whom it may concern,

Academic Reference for Kario Cynthia Joy – Student Number 94039

Strathmore University offers the Bachelor of Commerce (BCom) degree program. In their 4th year of study, each degree student is required to work on a Management Research Project. The project involves reading literature that relates to the research topic; data collection and analysis and finally preparing a written document of the research findings and recommendations.

Cynthia is requesting to gather information to be used in her research. She is accountable for all information extracted from you and ensure that it will be used for research purpose only and will be kept confidential.

The research is entitled **"FACTORS INFLUENCING ENVIRONMENTAL MANAGEMENT ACCOUNTING PRACTICES AMONG MANUFACTURING SMEs IN NAIROBI KENYA."**

We are looking forward for your co-operation and assistance to the above named student.

Yours faithfully,

STRATHMORE UNIVERSITY BUSINESS SCHOOL
UNDERGRADUATE PROGRAMMES
P. O. Box 59857 - 00200
NAIROBI
TEL: 0703 034 271 / 103

Jeremiah Mong'ayo
Program Administrator, Undergraduate Studies – Strathmore University Business School
jmongayo@strathmore.edu

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