

**SUPPLIER QUALITY MANAGEMENT AND  
OPERATIONAL PERFORMANCE OF CEMENT  
MANUFACTURING FIRMS IN KENYA**

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## DECLARATION

This research project is my work and it has not been submitted in any university for an award of merit.

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This research project has been submitted with my approval as the university supervisor.

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## **DEDICATION**

This project is dedicated to mum, late dad and son.

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## **ABBREVIATIONS AND ACRONYMS**

**CAPAs** Corrective and Preventative Actions

**KAM** Kenya Association of Manufacturers

**OP** Operational Performance

**RBVT** Resource-based View Theory

**RDT** Resource Dependent Theory

**SCQM** Supply Chain Quality Management

**SQM** Supplier Quality Management

**SRM** Supplier Relationship Management

**TCE** Transactional Cost Economics



## ABSTRACT

Evolving customer needs have forced firms to rethink their strategies and devise more efficient and effective ways to achieve operational performance (OP). Supplier quality management (SQM) involves a different set of management-driven efforts towards improving quality performance to realize supplier quality management. This calls for development of quality purchase policies and developing effective ways to maintain effective communication between the firm and the stakeholders. The main objective of this study was to establish the effect of SQM practices on operational performance of cement manufacturing firms in Kenya. Specific objectives were as follows: determining SQM practices utilized by cement firms in Kenya and establishing the link between SQM practices and OP of cement firms. To accomplish the objective of this research, a descriptive research design was employed to establish the link between SQM practices and OP of Kenya's cement producing firms. A census survey of 7 cement manufacturing companies was carried out since the population was small. A structured questionnaire was used to collect primary data. Analysis of data was done using descriptive statistics and regression analysis. It was found that the most popular SQM practices utilized by cement manufacturing firms were supplier performance measurement, supplier performance monitoring, supplier audit, competitive supplier selection and supplier integration. These practices were utilized to a large extent. The findings also established that supplier performance monitoring; supplier audit and supplier performance measuring were significantly related to OP. However, supplier integration supplier development practices and competitive supplier selection practices were insignificantly linked to OP. The study found that the challenges that faced cement manufacturing firms in implementation of SQM were failure to sponsor trainings for employees, failure to carry out regular supplier audits, high rate of employee turnover, limited funds and change resistance. It would be appropriate for cement manufacturing firms to consider sponsoring their staff for training and development programs regularly to build their technical skills and competencies. Top management should provide an enabling environment for employees by supporting them and giving them all the required resources and facilities to participate in the implementation of SQM practices. This study was limited to resources and time and this limited the scope of this study to cement manufacturing firms only. As such, the findings obtained under this study are limited to cement manufacturing firms and cannot be generalized to represent all manufacturing firms in Kenya. In future, researchers should consider duplicating this study to cover the entire manufacturing firms in Kenya, then findings can be compared, and a plausible conclusion drawn based on facts.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

Intense competitive forces are forcing firms away to look outside their boundaries to realize operational performance. Slack, Chambers and Johnston (2012) contend that achieving operational excellence through operations necessitates managers to think beyond their firm boundaries through effective use of supply chain. Fawcett, Ellgram and Ogden (2013) insist that the success of a supply chain lies on how well it's integrated with other supply chain partners to achieve agility and strengthen the entire supply chain as opposed to an individual organization. It comes to a time when organizations must choose the kind of supply chain to adopt since competition will be between supply chains.

Yeung and Lo (2012) acclaim that supplier quality management (SQM) entails a variety of management-driven effort, which are intended to ensure overall quality performance to achieve effective quality management on supply's side. These efforts involve developing quality purchasing policies, devising an effective communication approach between stakeholders and the firm, developing products and services and establishing long-term relationships with the suppliers. In their work, Harland et al. (2011) perceive SQM elements as a composition of integration of strategic practices where these practices stretch across inter-organizational borders to ensure satisfaction of new and existing clients. SQM also involves managerial efforts that are intended to create an operating environment that aids an organization to integrate supplier capabilities to the firm's organization processes.

Cement manufacturing firms in Kenya face various challenges due to inefficiencies of supply chain systems which result into stock out costs, delayed lead time and increased customer complaints (Dyer & Blair, 2012). Considering the increased demand for cement in Kenya because of numerous construction activities, there is need for cement manufacturing companies to adopt SQM to collaborate closely and get aligned to supply chain actions to boost SCP and firm operations. Globally, there are 159 countries and territories that produce cement, either through integrated cement facilities or grinding imported clinker (Global Cement Directory, 2018). These companies align their supply chains with effective commercial practices based on a profound understanding of market changes. This way, these companies can create value by focusing on micro markets (Edwards, 2017). Cement manufacturing firms in Kenya face various challenges due to inefficiencies of supply chain systems which result into stock out costs, delayed lead time and increased customer complaints (Dyer & Blair, 2012).

Whilst the expectation is cement industry should be booming considering the many construction happening across the country, contrary to this the ARM managing director Pradeep Paunrana when reporting the 2018 financial report he mentioned for the first time in the last 2 decades, the cement market and the construction sector declined in 2017 and this affected the economic and operating conditions, group turnover declined by 32% from KES 12.8 billion in 2016 to KES 8.7 billion in 2017. The group made a loss after tax of KES 6.5 billion for the year ending 31<sup>st</sup> December 2017 and earnings per share consequently dropped to a negative KES 6.83 per share (ARM Financial report 2018).

### **1.1.1 Supplier Quality Management**

Quality is defined in many ways but the most important way to define quality is from the customer's perspective. Manufacturers can differentiate perceived quality by differentiating their internal quality and SQM, they also need to understand the status of SQM practices across the industry for differentiation. SQM activities are steered by top management with the goal of enhancing operational performance (OP). These kinds of activities include measuring and trailing costs of supplier, usage of balanced scorecards to evaluate performance of suppliers, executing supplier audits and establishing efficient channels of communications with suppliers to ensure on-time delivery of products and services for improved customer satisfaction. Effectiveness of supplier quality on firm performance is direct, and of high magnitude. The quality of an organizational performance (output) is as good as the supplier quality performance (input). Various studies have attempted to address the way suppliers can boost their efficiency in their units of purchase and manage consumer expectation in uncertain environment. Supply chain constitutes a set of methods applied to align to manufacturers, suppliers, warehousing and distribution and the end customer in a way that ensures goods are easily produced and circulated at the correct quantities, delivered timely, to a convenient location and cost while meeting the satisfaction of customers. Kim-Soon (2012) indicates that supplier selecting and supplier development including supplier integration leads to formation of SQM system in which the responsibility of top management is deemed as the system driver. The underlying reasons why prompts firms adopt SQM to reduce non-conformances and supplier corrective and preventative actions (CAPAs) since it helps to mitigate errors and preventing the recurrence of such incidents (Kochhar & Saeed, 2012).

Organizations seek to minimize product quality and compliance issues through adoption of supplier quality management. Use of SQM enables organizations to achieve on-time delivery of products and services and reduced lead times. This helps to mitigate customer complaints that are mostly linked to failure of a product or service to meet the expected outcomes (Fynes & Voss, 2010). Over the past two decades, selection of suppliers and their performance rating play a significant contribution in management of supply chain since suppliers are central players of an organizational policy management (Bhutta & Huq, 2002).

### **1.1.2 Operational Performance**

Operations performance is the assessment of an organization's performance against standard measures of efficiency as well as environmental responsibility that constitutes cycle time, complying with the regulation and waste minimization. Operations performance also involves aligning the various business units with a firm towards ensuring that the units are helpful in the quest to achieve a set of centralized goals (Barnes, 2017).

Achieving this milestone happens through a review and optimization of the operations of the firm's units. To improve operational efficiency, its measurement first takes place. Because operational efficiency is based on the ratio of output to input, its measurement happens on both sides of the input and output (Ebdah, 2017). In most instances, the management measures primarily on the input side like in the case of the man hours or the unit of production required in producing a single unit. Although input indicators are imperative, they should not be considered as the only indicators of operational efficiency. Operational performance incorporates operational efficiency of the firm and focus towards realizing corporate strategy (Barnes, 2017).

Once a company defines its corporate strategy, the next step involves identifying the relevant operational performance goals to not only measure, but equally configure the environment in enabling accomplishment of those objectives. Speed, costs, dependability, quality, and flexibility serve as the five main objectives of operational performance. According to Barnes (2017) speed as a key element of operational performance serves in measuring how fast a firm can deliver the intended products and to generate sales quotes. Quality on the other hand entails the measure of how well the generated product meets certain specifications. The cost objective seeks to understand the level of variation that exists in product unit costs which is measured with the help of certain factors such as variety and product volume. Products that constitute unique varieties have a high tendency to sport lower volumes and high unit costs. Flexibility objective deals with operations that can change the product lines to address various requirements as well as adjusting the product lines faster to the new requirements. Lastly, the operational objective of dependability serves in measuring how dependable the organization is on matters of timely delivery of products to its client based on the associated costs and prices

### **1.1.3 Cement Manufacturing Firms**

Cement serves as a crucial building material for construction purposes in Kenya. In East Africa, Kenya not only serves as the leading cement producer, but also the leading consumer. As of August 2013, Kenya had seven companies that were involved in cement production. Three of the seven companies are listed in the Nairobi Securities Exchange market which includes East African Portland Cement Company, ARM Cement Limited, and Bamburi Cement (Waswa-Sabuni et al., 2015).

The other four are private companies, which are Savannah Cement, National Cement, Ndovu cement and Mombasa Cement. Plans are underway to introduce other cement producers to Kenya's growing market. The expected entrants are Cemtech Sanghi from India, Lake Cement and Dangote Cement from Nigeria. According to Mwangi (2018), over the past decade, the Kenyan construction industry has recorded speedy growth that has resulted from increased demand for housing and the focus by government on mega infrastructure projects like the Lamu Port-South Sudan-Ethiopia Transport Corridor as well as the standard gauge railway line. As the building industry continues to grow in line with cement production together with consumption, an increase of 15,781 tons was recorded at the beginning of 2005 to 564,000 tons in January 2017 (Mwangi, 2018). Following the increasing demand for cement top cement manufacturing producers are considering increasing their capacity to cater for the growing demand (Stewart, 2014).

To manage relationships in the supply chain, cement manufacturing firms need to establish cross-functional and cross-organizational businesses procedures through sharing of information, robust partnerships and effective management of operations (Leuschner, Rodgers & Charvet; 2013). Top management of these cement manufacturing firms need to learn to integrate viable supply chain members, learn, define and manage diverse relationships right from the suppliers' suppliers to customers' customers because it is only through managing relationships that these cement manufacturing firms can develop capabilities (Mwaura, 2015).

## **1.2 Research Problem**

The environment in which organizations do business is characterized by intense competition and greater uncertainties in demand and supply (Kaipia, Holmstrom & Hellstrom, 2012). Lancioni, Smith and Schau (2013) indicate that an individual organization cannot prosper in business on its own but rather it is the whole supply chain network that moves raw materials through processes of production and ultimately to customers, that link the market place. Thus, SQM practices are considered a powerful tool to achieve operational performance (Lambert, Cooper & Pagh, 2014). Cement industry in Kenya has had an impressive growth due to an increasing demand for cement emanating from the real estate and property development in Kenya (Ndetto, 2013). Cement manufacturing firms are now looking for coping strategies to survive. SQM is a way that cement manufacturing firms can consider aligning quality management principles into set goals and targets to cater for the unprecedented demand for cement across the country.

Globally, Quang, Sampaio, Carvalho and Fernandes (2016) explored the effect that SCQM had on firm performance in Vietnam and a positive relationship was discovered between SCQM and firm performance. Lo, Sculli and Yeung (2015) tested the link between supplier quality management and performance of manufacturing firms in China's Pearl River Delta and the findings showed that SQM practices contributed significantly to operational performance. Ross, Peter and Robert (2011) investigated the link between SQM and performance of service firms in Europe and a positive relationship was found between SQM and performance. Carlos, Maria and Ana (2011) found a positive correlation between SQM and performance of manufacturing firms. These studies have been done in a global setting whose situations are different from the local setting.



In Kenya, Wambani (2017) studied the link among SRM and OP of sugar (manufacturing) firms in Kakamega County in Kenya and the findings established that SRM was positively linked to OP.

Mwangi (2016) did an investigation involving SRM and OP of sugar firms in Kenya and the findings showed a positive relationship amid supplier relationship management practices and operational performance. Mwai (2015) examined the link between strategic quality management and competitiveness of generator suppliers in Kenya and the results showed that SQM practices were related positively to competitiveness. Kitheka and Mulwa (2013) investigated the effect of SQM on firm performance of supermarkets in Kakamega town and the findings showed that supplier quality management practices improved efficiency in customer service delivery, reduction of operational costs and overall performance.

Local studies have paid much attention to SRM. Limited studies have zeroed in on the link between SQMP and operational performance. Secondly, these studies have limited themselves to sugar manufacturing firms, supermarkets, parastatals and generator suppliers. A limited focus has been given to cement manufacturing firms. It is against this backdrop that this study sought to find an answer to the question: what is the effect of supplier quality management practices on operational performance of cement manufacturing firms in Kenya?

### **1.3 Research Objective**

The main objectives of the study;

Effect of supplier quality management practices on operational performance of cement manufacturing firms in Kenya.

Specific Objectives;

- i. Determine the supplier quality management practices adopted by cement manufacturing firms in Kenya
- ii. Establish the relationship between supplier quality management practices and operational performance of cement manufacturing firms in Kenya.

#### **1.4 Value of the Study**

Policy makers, Kenya Association of Manufacturers (KAM) can use the empirical findings to set policies that will encourage firms to adopt and implement SQM practices. This will enhance supplier chain performance resulting into efficient delivery of products and services, reduced lead time and improved customer satisfaction.

Operations management practitioners and top management of cement firms will learn some of the SQM best practices. They will understand key indicators of operational performance and how to measure operational performance. Firms in other sectors like service industry will appreciate the significance of SQM in firms and its effect on firm operational performance.

The study is hoped to contribute to the existing literature in the field of SQM. Students will deepen their understanding on the theories that support this study, their relevance and application to this study. It will form the basis for further research on the link between SQM and operational performance and other related issues under the umbrella of SQM.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Research in the field of SQM has prompted empirical kind of discussion amongst scholars over the last decades. The gives a reviews empirical literature and theoretical background on SQM. It discusses key theories that underpin SQM, and the empirical literature on several SQM practices and the link between SQM practices and operational performance. Finally, a summary of the reviewed literature has been given and a conceptual framework.

#### **2.2 Theoretical Framework**

Some theories provide insights into the rationale that underlies SQM practices. This section discusses Resource-Based View Theory (RBVT), Transactional Cost Economics Theory (TCE) and Resource-Dependence Theory (RDT). A proposition of the theories has been given, theoretical developments, assumptions, critics and relevance to this study. Below is the discussion:

##### **2.2.1 Resource-Based View Theory**

RBV offers the basis of understanding the concept of economic rent and perceive a firm as constituent of a collection of various capabilities. Capabilities found in supply chain in view of RBV and its dynamic development explains how supply chain operations can do better compared to its rivals. Such capabilities drive strategy implementation to achieve desired results (Barney, 1991; Chang, Lin & Shen, 2002). Barney (1991) opines that sustained operational excellence and improved overall performance can be achieved by exploiting distinct, and rare resources that are not easy to replicate. Resources that are valued are resourceful to an enterprise in

harnessing opportunities that mitigate environmental threats (Barney, 1991; Hart, 1995). Daft (1983) explains that resources constitute assets and finances, capacity, processes, organizational attributes, vital information and knowledge.

In the perspective of SCQM, integrating members of supply chain endows the organization with valuable resources and capabilities that it lacks. Within RBVT, supporters of knowledge-based theory argue that RBVT does not go far enough (Grant, 1996; Nonaka & Noboru, 1998). They maintain that RBV handles knowledge as a unique kind of resource rather than having unique attributes; this is because it disregards the difference that might be present amid different kinds of knowledge-based capability. The value in knowledge –based view as far as SCQM is concerned is in sharing of internal and external organizational supply chain collaboration (Lavassani & Movahedi, 2010).

### **2.2.2 Transactional Cost Economics Theory**

Meyer and Rowan (1977) posit that Transaction Cost Economics (TCE) hold that firms must organize activities that are essential in the firm and find ways that firm can benefit from resource sharing across various businesses within the boundaries of the firm. Organizations view SQM to minimize cost and to protect the organization from known exchange hazards. TCET focuses on limits of costs in every transaction within relational traits that defines exchange process in supply chain relationships. Sinéad and Benn (2011) explain a contract design is one of the key tenets of TCE in which important requirements such as price, quality and governance must conform to the buyer's agreement.

DiMaggio and Powell (1983) indicate that a TEC perspective is mainly applied to explicate relational governance particularly with relationships being examined

differently from the environmental context which affects them. From TCE perspective, organisations must internalize their activities when the benefits are more as compared to the costs involved. Transactions that are internalized should be partially aligned within the existing firm activities and managed effectively by an organization. This increases operational and coordination costs (Williamson, 1979), which entail delays, distort of information and incompleteness. Moreover, coordination costs might increase when firm activities are more diverse (Kostova & Zaheer, 1999). The major limitation of TEC theory is that it disregards the idea of supply chain management integration where supply chain relationships and individual cost costs are examined in isolation.

### **2.2.3 Resource Dependence Theory**

This theory was postulated by Jeffrey Pfeffer (1978) and Gerald Salancik (1978), Americans business theorist and organizational theorist respectively. This concept was first explained in the book “The External Control of Organizations: A Resource Dependence Perspective” written by these two authors. How organizations behavior is influenced by external resources utilized by the organization for example information communication technology. Resource dependent theory is built from the works of previous scholars such as Emerson (1962). RDT is premised on the idea that resources are critical in achieving enabling the firm to accomplish its goals. Thus, accessing and controlling resources is considered a critical basis for power.

The basic argument of RBT is that firms depend on resources; these resources originate from the environment where other firms are found. The resources that a firm requires are thus often in the hand of other firms.

The environment is perceived as the source of resources; however, these resources are limited and vital for firm survival. Lack of control of these critical resources is the major cause of environmental uncertainty (Nienhüser, 2008). Resource dependence theorists maintain that to minimize the impact of environmental uncertainty, it is worthwhile for the firms to develop and sustain effective relationships with the external environment (Pfeffer & Salancik, 2003). RDT has been scrutinized in several review and meta-analytic studies.

Firms need to take actions such as forming strategic alliances, strategic mergers and acquisitions to counter dependencies and improve organizational autonomy and legitimacy. This theory appreciates that very few organizations are self-sustaining (Heide, 1994). Thus, the theory postulates that organisations are involved in exchanges with the environment for resources. Harrison, Hitt, Hoskisson and Ireland, (2001) opine that through organizational interdependence, organizations can form synergy by combining resources with other complementary resources of organizations whom they collaborate with thus developing a bundle of resources comprising of unique resources that is difficult to duplicate hence leading to competitive advantage. This study considers the view of interdependence as the basis of SQM borrowed from RDT.

### **2.3 Supplier Quality Management Practices**

The concepts of SQM have largely been explored based on integration of strategic practices whereby these practices cut across boundaries between organisations in ensuring satisfaction of both new and existing customers. SQM involves managerial efforts that are required to create an operating environment whereby a manufacturer integrates supplier capabilities to the operational processes. It is possible to classify

such efforts into practices that fall under managerial responsibility. The practices have been discussed as follows:

### **2.3.1 Supplier Monitoring**

Supplier performance monitoring is seen as a cornerstone towards establishing, developing and maintaining an effective relationship among the firm and the suppliers. Firms need to monitor performance of their suppliers to ensure that they conform to the set standards of the buyer. The entity ensures that the supplier modifies their managerial behavior and aligns their relationship to operational and strategic goals of the buyers. By monitoring suppliers' performance, decision makers get essential information that helps them to plan, direct and control the activities of the organization.

Moreover, it enables the management to assess performance and detect any kind of deviations as well as educate the suppliers on key performance dimensions and improvement activities through identifying deviations from the standards. According to Kochhar and Saeed (2012), purchasing managers have a responsibility of monitoring supplier performance. Traditionally, price is regarded as an essential supplier monitoring factor. However, due to changes in competitive priorities, it has led to emergence of other important aspects like quality, flexibility, time, dependability and building long-term relationships.

To establish an effective partnership between the buyer and suppliers, supplier performance should be monitored continuously through various elements, and offer feedback which is required for improvement. These elements might be in form of tangible or intangible form and relay essential information to suppliers and communicate effectively, the expectations of the buyer, where it is necessary so as to

ensure that corrective actions are taken. Kim-Soon (2012) argues that the use of convenient performance measurement structures of suppliers originates from the 'perfect order' concept. This concept has three elements that constitute full order delivery and invoice with very minor errors. This concept is extended to cover delivery of the right of the right product, protection from damage and compliance with quality standards. In achieving the laid-out customer targets, the supplier is expected to measure a set of other internal factors.

### **2.3.2 Supplier performance measurement**

Supplier performance measurement is important and plays as the baseline for actions and improvement. It's a business process used in measuring, analyzing and managing suppliers performance over a period so as to ensure supplier are delivering services and goods as per the agreement. Most firm use this practice to drive continuous improvement, minimize risks and costs. Both manual and digitally enabled systems are available to support this practice.

The firm engages in a systematic process that involves observing, recording and tracking the activities of the suppliers and information for measuring purposes as well as its progress towards attaining set goals. Trent (2014) explains that the information which is collected by monitoring is utilized to analyze and assess all the required elements of the firm or a department to measure its level of effectiveness and adjust inputs where needed.

### **2.3.3 Competitive Supplier Selection**

Before selecting suppliers, an organization must arrive at a decision of whether to rely on single sourcing or various suppliers. Selecting suppliers happens through various mechanisms that comprise of offline competitive bids, direct negotiations, or reverse



auctions. Irrespective of the mechanism used, supplier selection should consider the total cost of using a specific supplier as opposed to focusing only on the purchase price. According to Kochhar and Saeed (2012), supplier selection serves as one of the most imperative decision-making aspect because selection of the right suppliers leads to a significant reduction of the purchasing costs and this gives the organization a competitive edge. Supplier decision-making comprises of trade-offs between different criteria that comprises of both qualitative and quantitative factors like flexibility, delivery, and quality among others.

Additionally, supplier selection decisions should consider both operational and strategic factors and considers tangible and intangible factors while conducting the analysis. Ross, Peter and Robert (2011) indicate a supplier that is ideal is identified by the procuring firm which considers all ideal scores important in each criterion. The rating team should be drawn from various departments within the organization that comprise of procurements, finance, marketing, warehousing and production among others.

Additionally, selection of the best suppliers should be based various aspects like quality, price, service, logistics, and quantity. Based on the existing literature, these factors are essential when deciding to choose a supplier. For instance, a consideration of prices with discounts and terms of payment; Quantity on the other hand relates to the ability of a supplier to deliver amounts in small quantity and large amounts of products (Visani et al., 2014). Quality on the other hand focuses on the attributes of a product like durability and failure rate. Logistics captures a summary of delivery performances as well as service together with additional items like after-sales service. Notably suppliers should be engaged fully in the total quality management systems of an organization to ensure the process is complete.

This as a result enables suppliers to fully appreciate customer wants and the level of quality conformance that they need to maintain. Before selection of suppliers, several methods can be applied in evaluating their performance with the most notable one relating to compilation of profiles of suppliers. Supplier selection entails use of qualitative and quantitative factors so as to have an understanding of the effectiveness of supplier in organisational strategy and customer needs (Kausik & Mahadedevan, 2012).

#### **2.3.4 Supplier Audits**

Conducting supplier audits serves as another important quality activity. Although the exercise is time consuming, its importunate cannot be ignored because it adds value to an organization. In modern firms, a quality auditor plays the role of an adviser by identifying areas that require improvement. Many organizations are equally conducting audits to detect non-conformance; a situation where the auditor develops a list of all possible situations that he has identified as things done in the wrong way (Fynes & Voss, 2010). However, it is important noting that audits to suppliers should not be deemed as an exercise of breaking the existing relationship, but rather, the focus should be directed at improving and building a partnership relationship. This is because once audit is complete; the payback should be based on improved understanding of every organization's requirement that is developed from the audit process. Trent (2014) argues that the role of the supplier is not necessarily finding out fault but maintaining transparency and traceability within the supply chain channel. The most critical thing when auditing the suppliers is ensuring continuous improvement in quality delivery of products and services to all the stakeholders. Lo, Sculli and Yeung (2012) explain that supplier audits helps to detect weaknesses

within the supply chain with a strong emphasis on supplier corrective and preventive actions as well as maintenance.

Monczka, Trent and Callahan (2013) indicate that various risks are involved in supply chain such as production; however, these risks can be handled more effectively through accountability and transparency. Supplier audit helps firms to ascertain whether the suppliers are performing or not.

With supplier audits, firms can detect material documentation that depicts production gaps, breach of contracts and any other misconduct. When both parties abide with contractual obligations and act in good faith all the time and prove this in an objective audit report then this will certainly result into a mutual value-added relationship.

### **2.3.5 Supplier Development**

Development of suppliers relates to activities that are undertaken to improve the quality of supply with the objective of improving operations in supplier side. Buying organizations may rely on several activities in developing the performance or capabilities of suppliers. Past studies (Visani et al., 2014) have identified activities that are undertaken in line with supplier development. These activities comprise of introduction of competition into the supply base, future benefits promise, raising performance expectations, training and developing supplier personnel, and exchange program of employees amidst the buyer and suppliers including direct investment in suppliers through buying firm. Organizations get involved in development of suppliers as a way of reacting to markets that are competitive. It is possible to gain competitive advantage from supply initiatives like reducing the product cycle, technological innovations, and increased demand of quality levels by consumers.

Organizations that operate in highly competitive markets invest heavily on their supplier development programs.

Supplier development may serve as a major undertaking that requires resources of capital, money, and human resources by both the supplier and customer. Therefore, both parties should demonstrate adequate commitment. Trust is equally required due to the associated risks. The associated risks emanate from the fact that success is not guaranteed, and organizations must share both confidential and strategic data. Cooperation and compromise is equally required in supplier development. Kim-Soon (2012) indicates the firms must agree about key issues like performance metrics. Additionally, the firms must possess distinctive organizational as well as governance structure that facilitates cumulative learning on a long-term basis. As such, trust and commitment alone are inadequate because the firms must have the ability of supporting learning on the organizational level. Partnership is important in the whole process of supplier development where supplier and customer must demonstrate commitment of working together.

### **2.3.6 Supplier Integration**

Supplier integration comprises activities that are focused in building collaboration, improving operational efficiency and to leverage strategic positioning. To boost performance on product designs, supplier involvement in development of product identity, need to appreciate the basic structure of the link amidst suppliers and buyers. In environments that provide for highly co-operative between the suppliers and buyers, they have a high likelihood of engaging their suppliers in the process of developing products. On the other hand, environments in which supplier and buyer relationships are confrontational, there is a smaller likelihood of engaging suppliers in product development processes. Kochhar and Saeed (2012) maintain that the success

of Japanese companies is associated with the close relationship between customers and suppliers.

Although the end producer has the probability of retaining the design of some crucial parts regarded as important for the success of a product, suppliers with specialized knowledge are used in providing cutting-edge technology in their respective fields while on the other hand general component suppliers provide production knowledge thus helping in improving manufacturing design. Most firms today rely on supplier integration towards developing a competitive advantage. Involvement of suppliers happens in early stages of design and development. Supplier involvement comprises of various practices that emanate from simple consultation about design ideas to ensure that suppliers take responsibility of product design (Fynes & Voss, 2010). Through supply source integration, there are various benefits derived by an organization. These benefits comprise of reduced lead-times i.e. product development, improved communication, significant costs savings from improved productivity, improved financial performance, trustworthy products with fewer recalls and a reduction in complaints from customers (Kochhar & Saeed, 2012).

## **2.4. Operational Performance**

Performance of an organization can be done using different sets of measures based on the objective that an organization seeks to achieve. Economic or financial viability serves as one of the key performance dimensions. According to Li and Benton (2016), Berk and Moinzadeh (2018), operational performance considers quality and economic aspects of an organization. Li and Benton (2012) assert that performance measures are classified into internal measures of quality, external quality measures, internal cost

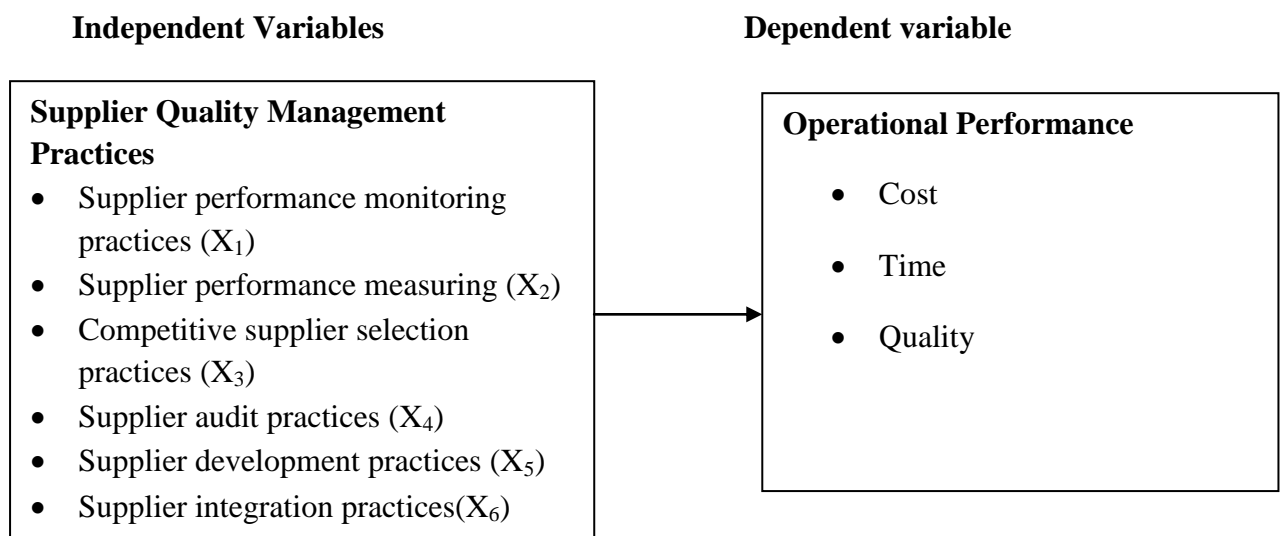
measures, and external measures. External financial status measures involve the market position or the overall financial position of a company.

Internal quality measurements consider different organizational levels that consist of all internal processes or customer service. External quality measurement involves aspects like perceived quality and customer satisfaction. Barro, Huckman and Kessler (2016) further indicate that internal cost measures should be divided into utility and production efficiency measures. Quality measures ensure a more comprehensive picture of an organization's performance.

## 2.5 Conceptual Framework

Figure 2.1 showed the expected association amidst SQM and operational performance. The independent variables included monitoring the performance of the supplier, supplier audit practices, supplier development practices, supplier integration practices and competitive supplier selection practices. The dependent variable was operational performance.

**Figure 2.1: Conceptual Framework**



**Source: Researcher, 2018**

## **2.6 Summary of the Literature Review**

Supplier quality management acts as a catalyst that many manufacturing firms look for to control costs of production, minimize variations and enhance compliance to quality standards. Effective implementation of SQM practices enables organisations to develop capabilities in processes and activities that are related to product quality and real time production as well as enhancing supply chain efficiency and integration.

Moreover, the literature covers the theories that support the link between SQM and operational performance; RBV and TCET and RDT. A detailed coverage of SQM practices has been given, showing how these practices are applied by organisations and their significance.

As per the objective of the study, it is hoped that SQM practices will contribute towards improving operational performance. Hence, the study considers adopting a descriptive study design to establish the association amidst SQM practices and OP.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter covers the research methodology applied in the study. Research methodology can be described as a process used to collect data and information for purposes of making business decisions. The sections discussed in this chapter include research design, the study population, data collection procedures, data analysis and presentation.

#### **3.2 Research Design**

According to Sekaran, (2006) a research design is an overall strategy chosen by a researcher to combine certain elements in a study in a manner that is logical and consistent by addressing the question of this research. This study adopted a descriptive research design. The choice of this design was because it was useful in establishing the nature of existing situation and current conditions and in analyzing such situations and conditions.

#### **3.3 Target Population**

A population comprises of a collection of objects those possess similar traits that can be used to make inference (Kothari, 2011). Target population included 7 cement manufacturing firms that were operational as at 31<sup>st</sup> December 2017 as presented in Appendix II. The target population was too small hence it is not normally distributed.

#### **3.4 Data Collection**

The study used primary was administered through pick and drop, email and self-administered questionnaire that were designed to enquire explicit responses. The



researcher conducted a cross-sectional study on the extent of adoption of SQM and its effect on operational performance. The questionnaires had three parts. The first section contained questions on the general information about cement manufacturing companies and the respondents, and the second part contained questions on the SQM practices used by cement manufacturing firms. The third part contained questions on the link amidst SQM practices and OP of cement manufacturing companies in Kenya. The respondents for this study were managers working in Finance, Operations and Supply chain departments. Supply chain managers and quality managers provided information on SQM and the finance managers and operations managers provided information on operational performance. The choice of this category of respondents was because they are directly or indirectly involved in decision making on matters of SQM practices and operational performance. The questionnaires were administered by mail and some dropped and picked up later at an agreed time with the respondent.

### **3.5 Data Analysis**

Analysis of data was conducted using SPSS. The first objective was analyzed using descriptive statistics; the second objective was analyzed using inferential statistics: regression analysis. Frankfort-Nachmias and Nachmias (2008) posit that descriptive statistics allow meaningful description of scores and measurement using indices and statistics.

Presentation of data was done in form of quantitative and qualitative reports that were presented in form of tables and essay form. For the quantitative reports, the tables consisted of mean and standard deviation values that were used to make interpretation of the analysis. Means and standard deviations were utilized to illustrate response frequencies. Tables were used to display the rate of responses and to facilitate

comparison. A regression equation was adopted in establishing the link between SQM practices and operational performance. Regression analysis was carried out using performance measures in which operational performance was regressed against SQM practices.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where;

Y = OP (dependent variable) of cement manufacturing firms in Kenya.

$\beta_0$  = constant

$\beta_1, \dots, \beta_n$  = coefficients

$X_1$  = Supplier performance monitoring practices

$X_2$  = Supplier performance measuring

$X_2$  = Competitive supplier selection practices

$X_3$  = Supplier audit practices

$X_4$  = Supplier development practices

$X_5$  = Supplier integration practices

$\varepsilon$  = error term

## **CHAPTER FOUR**

### **DATA ANALYSIS, RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter provides a discussion of the findings in line with respondents' feedback and research objectives. Questionnaires were utilized to seek several attributes of SQM practices and operational performance of cement manufacturing firms in Kenya. The chapter covers descriptive statistics.

#### **4.2 Response Rate**

The study did a census survey involving all cement manufacturing companies licensed by KAM as at 31st December 2017. Total number of questionnaires which had been distributed was 28 and from these, 27 questionnaires were returned and duly filled. This represents a response of 96.43% which is considered to represent a population; this is consistent to the observations of Fowler (1984).

#### **4.3 General Information**

This section has discussed the demographics of the respondents that includes social traits such as duration of operation of cement manufacturing firms, position of the respondents and the length of service of the respondents that can potentially influence SQM of cement manufacturing firms.

### 4.3.1 Period of Operation

The respondents were requested to indicate the duration that the cement manufacturing firms had been in operation and the results showed that 100% of the respondents agreed most cement firms had been operational in a period of more than 10 years.

### 4.3.2 Position in the Organisation

The respondents were requested to indicate the position that they held at cement manufacturing firms to establish if they were in a position to provide reliable and accurate information in line with the objectives for this study. The results are provided in Table 4.1.

Table 4.1 Position in the Organization;

Position	Frequency	Percent
Quality manager	7	25.93%
Finance managers	6	22.22%
Supply chain managers	7	25.93%
Operations manager	7	25.93%
Total	27	100.0%

**Source: Research data**

In Table 4.1, the findings show that 25.93% of respondents were heads of operations, 22.22% respondents were quality managers, 25.93% respondents were finance managers and 25.93% were supply chain managers. These imply that majority of the respondents worked in middle level management.

### 4.3.3 Length of Service in the Current Position

The respondents were requested to indicate the duration that they had served in their current position in cement manufacturing firms. The results are shown in Table 4.2.

**Table 4.2: Length of Service in the Present Capacity**

Period	Frequency	Percent
Less than 5 years	3	11.11%
5-10 years	12	44.44%
10-15 years	7	25.93%
Above 15 years	5	18.52%
Total	27	100%

**Source: Research data**

The results in Table 4.2 shows that majority 44.44% of the respondents had served in their current position for a period between 5-10 years, 11.11% of the respondents had served for less than 5 years, 18.52% of the respondents had served for a period above 15 years and 25.93% between 10-15 years. This imply that majority of the respondents attained a relevant experience in SQM practices and OP.

### 4.4 SQM Practices

SQM were the independent variable of this study. It was necessary to establish the respondents' views regarding supplier quality management practices (SQMP) in their organization. The SQMP were evaluated on a 5-point Likert scale, and it was expected that the respondents would either agree: "to a very large extent", "large extent", "moderate extent", "little extent", or "Not at all". For every single question, the response which denoted the most positive response for these practices was allocated 5 points and then 4, 3, 2, and 1 for the least positive respectively.

For purposes of this analysis, the following was adopted a mean score of  $\geq 4.5$  meant that the respondents agreed to a very large extent;  $3.5 \leq 4.5$  meant that the respondents agreed to a large extent;  $2.5 \leq 3.5$  meant that the respondents agreed to a moderate extent;  $1.5 \leq 2.5$  meant that the respondents agree to a little extent, and a score of  $\leq 1.5$  was interpreted to mean that the respondents did not agree at all. A standard deviation of  $\leq 1$  implied that the respondents held similar perception in the rating of the statement whereas a standard deviation that was greater than 1 implied that the respondents failed to agree regarding the statement. A total of 48 statements were utilized to evaluate SQMP in cement manufacturing firms.

#### 4.4.1 Supplier Monitoring Practices

Supplier monitoring practices is expected to enhance firm performance of cement firms. The respondents were asked to indicate the extent to which they agreed with certain aspects of supplier monitoring practices using eight statements.

**Table 4.3 Supplier Monitoring Practices**

<b>Supplier Monitoring Practices</b>	<b>Mean</b>	<b>SD</b>
The organization makes decisions using important information to plan, direct and control organizational activities	4.58	0.85
Top management can alert and educate suppliers on key performance dimensions	4.42	0.82
The organization maintains effective partnership by monitoring supplier	4.52	0.78
The organization monitors the performance of suppliers regularly	4.41	0.87
The organization provides timely information to suppliers	4.57	0.89
The organization communicates the expectations of the buyers	4.10	0.67
The organization integrates its relationship with both operational and strategic goals of the buyer organization	4.25	0.68

The organization uses information that is collected when measuring supplier performance	3.95	0.57
N=27: Mean Score	4.35	0.77

*SD is standard deviation*

*Source: Research data*

The results are depicted in Table 4.3. The findings revealed that some practices are utilized to a very large extent (mean of  $\geq 4.5$ ) these include: decision making using essential information to plan and control activities of the firm, providing timely information to suppliers and maintaining effective partnership through monitoring the suppliers. To a great extent (mean of  $3.5 \leq 4.5$ ), the organisation: alerted and educated suppliers on key performance dimensions, monitored supplier's performance frequently, communicated buyers' expectations, integrated operational and strategic goals of the buyer organisation and used information that was collected when assessing supplier performance. Mean score of 4.35 means that most of cement manufacturing firms practiced supplier monitoring.

#### **4.4.2 Supplier Performance Measurement practices**

The study sought to establish supplier performance measurement practices that were employed by cement manufacturing companies and results are depicted in Table 4.4.

**Table 4.4 Supplier Performance Measurement Practices**

<b>Supplier Performance Measurement practice</b>	<b>Mean</b>	<b>SD</b>
The firm conducts supplier performance measurement process	3.90	0.80
The firm examines the performance of the supplier regularly	3.41	0.52
The firm examines cost, quality and lead time	3.82	0.75
The firm maintains long-term relationships with its suppliers	3.51	0.61
The firm communicates the indicators of performance to suppliers	4.10	0.81

Stakeholders are involved in key decisions	4.51	0.71
The firm conducts due diligence to all its new suppliers	4.21	1.02
The firm gives feedback upon review	3.76	0.76
N=27: Mean Score	3.90	0.75

*SD is standard deviation*

*Source: Research data*

The findings disclosed that to a very large extent (mean of  $\geq 4.5$ ), stakeholders were involved in key decisions of cement producing firms. To a great extent (mean of  $3.5 \leq 4.5$ ), the firm; conducted due diligence and communicated performance indicators to suppliers, did suppliers' performance assessment process, examined cost, quality and lead time, provided feedback after review, maintained sustainable supplier relationships and performed frequent reviews of supplier performance. The mean score was 3.90 and a standard deviation of 0.75, which imply that most cement producing firms embraced supplier performance practices.

#### **4.4.3 Competitive Supplier Selection Practices**

The study sought to find out how cement manufacturing firms applied competitive supplier selection practices using a set of eight statements and the outcome is depicted in Table 4.5.

**Table 4.5 Competitive Supplier Selection Practices**

<b>Supplier Performance Measurement practice</b>	<b>Mean</b>	<b>SD</b>
The firm decides on whether to rely on one supplier or many	3.67	0.54
The firm engages supply chain partners when making supplier selection decisions	4.10	0.66
The firm makes consideration of strategic and operational factors in supplier selection decision	4.45	0.64



The firm consists of a supplier rating team that determines supplier performance	4.01	0.43
The firm focuses primarily on the durability of the product and the rate of failure	3.82	0.59
The firm aligns its suppliers to TQM programs	3.54	0.57
The firm involves its suppliers in customer needs	3.78	0.82
The firm examine supplier performance with more concentration on supplier profile	3.81	0.76
N=27: Mean Score	3.90	0.63

*SD is standard deviation*

*Source: Research data*

The findings established that to very great extent (mean of  $\geq 4.5$ ), the organisation made consideration of strategic and operational factors when conducting supplier selection. To a great extent (mean of  $3.5 \leq 4.5$ ), the firm; involved supply chain partners in supplier selection decisions, consists of a supplier rating team that determines the performance if a supplier, considers product durability and the rate of product failure, examines the performance of the supplier, involves its suppliers in customer needs, makes decision on whether to depend on a single supplier or many suppliers and aligning suppliers to TQM programs.. The mean score was 3.90 and a standard deviation of 0.63, which means that many cement manufacturing firms used competitive supplier selection practices.

#### **4.4.4 Supplier Audit Practices**

The respondents were asked to indicate the extent to which supplier audit practices were utilized. The results are shown in Table 4.6.

**Table 4.6 Supplier Audit Practices**

<b>Supplier Audit Practices</b>	<b>Mean</b>	<b>SD</b>
The firm easily identified weak areas	3.51	0.66
The firms conform to supplier audit	3.81	0.67
The firm has formally improved how it relates to its suppliers	3.56	0.68
The firm has improved its level of understanding of requirements required in the audit process.	3.67	0.78
The firm upholds transparency and traceability in supply chain channel	3.60	0.79
The firm upholds continuous improvement in quality delivery	3.68	0.82
The firm easily detects weaknesses in its supply chain	3.51	0.72
The firm lays more importance on supplier corrective and preventive actions	3.72	0.67
N=27: Mean Score	3.62	0.63

*SD is standard deviation* *Source: Research data*

The results established that supplier audit practices attained a mean of 3.5 and above, implying that these practices were largely utilized. These include: conforming to supplier audit, supplier preventive actions, continuous quality improvement, improved understanding on audit process requirements, transparency and accountability within supply chain network, improved relationships with suppliers, easy to detect weakness in supply chain and identify areas of weakness. A mean score of 3.62 implies that many firms embraced these practices.

#### 4.4.5 Supplier Development Practices

The study sought to explore the extent to which cement manufacturing companies employed supplier development practices using a set of eight statements and the results are depicted in Table 4.7.

**Table 4.7 Supplier Development Practices**

<b>Supplier Development Practices</b>	<b>Mean</b>	<b>SD</b>
The firm depends on certain activities to develop supplier capabilities	3.87	0.62
The firm is reactive to competitive markets	3.76	0.65
The firm has gained competitiveness through initiatives for example short-product life cycles	3.69	0.63
The firm invests greatly on supplier development programs	3.42	0.77
The firm disseminates strategic and confidential information	3.31	0.77
The firm concur with critical aspects like performance metrics	3.88	0.82
The firm use dynamic governance systems and accommodates long-term learning	3.54	0.72
The firm has built partnerships together with supply chain stakeholders	3.81	0.67
N=27: Mean Score	3.66	0.71

*SD is standard deviation*

*Source: Research data*

The findings established that to a great extent (mean of  $3.5 \leq 4.5$ ), the firm; used essential aspects of performance, relied on some activities to build supplier capability, built partnerships with supply chain members, was reactive to competitive markets and thus firms gain competitiveness due to short-product life cycles and use of flexible governance systems. To a moderate extent (mean of  $2.5 \leq 3.5$ ) the firm invested greatly on supplier development programs and sharing confidential

information. The mean score was 3.66 and standard deviation of 0.71, this implied that many cement producing firms used supplier development practices.

#### 4.4.6 Supplier Integration Practices

To establish the extent to which supplier integration practices was used by cement manufacturing firms, respondents were asked to indicate the extent to which they used these practices. The results are presented in Table 4.8.

**Table 4.8 Supplier Integration Practices**

<b>Supplier Integration Practices</b>	<b>Mean</b>	<b>SD</b>
The firm adopts supply chain integration	4.46	0.75
The firm focuses on improving product designs	4.10	0.81
The firm engages buyers and suppliers in supplier product development processes	3.31	0.63
The firm uses their relationship with suppliers to access modern technology	3.32	0.77
The firm engages suppliers in early stages of designing and development products	3.34	0.69
The suppliers are involved in product designs	3.34	0.62
The firm adopts supply integration which results into reduced lead time	3.65	0.72
The firm registers fewer customer complaints	3.92	0.87
N=27: Mean Score	3.68	0.73

*SD is standard deviation*

*Source: Research data*

The results showed that to a very great extent (mean of  $\geq 4.5$ ), the organization utilized supply chain integration (4.46). To a great extent (mean of  $3.5 \leq 4.5$ ), the organization; integrated its supply chain to minimize lead time, registered limited customer complaints and it focused on improving product designs. To a moderate

extent (mean of  $2.5 \leq 3.5$ ) the firm; involved supply chain partners in developing supplier product, used its association with suppliers to access resources like technology, involved suppliers at initial stages of product development and suppliers were involved in product designing. The mean score was 3.68 and standard deviation of 0.73, this implied that many cement producing firms used supplier development practices.

#### 4.5. Challenges Facing Cement Firms in the Implementation of SQM Practices

The respondents were asked to indicate the challenges that cement firms faced during implementation of SQM practices. The results are shown in Table 4.9.

**Table 4.9 Challenges Facing Implementation of SQM Practices**

<b>Challenges</b>	<b>Mean</b>	<b>SD</b>
Lack of continuous training programs	4.51	0.67
Irregular supplier audits	3.82	0.74
Higher employee turnover	3.79	0.81
Finances	3.61	0.82
Change resistance	3.56	0.45
N=27: Mean Score	3.86	0.70

*SD is standard deviation*

*Source: Research data*

The findings in Table 4.5 indicate that cement manufacturing firms failed to sponsor their employees to a continuous training program as shown by the mean of 4.51 and a standard deviation of 0.67 ( $<1.0$ ) which imply that this response was largely agreed by the respondents.

In view of this, Stockdill and Morehouse (2013) who found that lack of continuous training was a major challenge that hindered organizations from implementing SQM

practices. It was also revealed that there were irregular supplier audits as evident by a mean of 3.82 and a standard deviation of 0.74 (<1.0) implying that the response was widely agreed by respondents. This finding is consistent to Groznik et al. (2011) who indicated that found that inadequate supplier audits hindered effective implementation of SQM practices.

Other challenges that faced by cement manufacturing firms as pointed by the respondents included high employee turnover, inadequate finances and change resistance. The mean values were 3.79, 3.61 and 3.56 respectively. The standard deviations were 0.82, 0.45 and 0.70 respectively, implying that these responses were agreed by most of the responds. These findings are supported by Kitheka and Mulwa (2013) who established that high employee turnover, inadequate finances and resistance to change as the main challenges that hindered implementation of SQM practices.

#### **4.6 The Relationship between SQM practices and Operational Performance**

To achieve the second objective for this study which was establishing the relationship between SQM practices and operational performance of cement manufacturing firms, the study adopted a regression model to test the hypothesis for this study.

**Table 4.10 Summary of the Model**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775 <sup>a</sup>	.535	.382	1.013

The results in Table 4.10 depict that SQM practices accounted for 53.5% variation in operational performance of cement firms.

**Table 4.11 Analysis of Variance**

Model	Sum of Squares	Df	Mean of Square	F	Sig.
Regression	7.339	6	1.223	1.023	.000 <sup>b</sup>
Residual	23.891	20	1.195		
Total	31.23	26			

The outcome shown in Table 4.11 show that the model used is statistically significant:

F (6, 20) =1.023 and a p-value of .000 (<0.05).

Model	Unstandardized Coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.210	.699		1.500	.123
Supplier performance monitoring practices	.044	.125	.345	4.332	.000
Supplier performance measuring	.465	.136	.444	3.221	.002
Competitive supplier selection practices	-.365	.123	-.334	-1.914	.201
Supplier audit practices	.139	.138	.129	2.872	.021
Supplier development practices	-.327	.521	-.232	-0.981	.389
Supplier integration practice	.145	.425	.066	2.156	.057

A) Dependent Variable: Operational performance

The regression model obtained from this study is as follows:

$$\text{Operational performance} = 1.210 + 0.044X_1 + 0.465X_2 + 0.139X_3 + \varepsilon$$

Where Y= Operational performance of cement manufacturing firms in Kenya

$X_1$  = Supplier performance monitoring

$X_2$  = Supplier performance measuring

$X_3$  = Supplier audit practices

$\varepsilon$  = Error term.

The criteria for comparing whether the predictor variables were significant in the model was done by comparing the corresponding p-value obtained and  $\alpha=0.05$ . When



probability value is less than  $\alpha$  then the predictor variable is significant, if it exceeds  $\alpha$ , the predictor variable is insignificant.

From the regression results, competitive supplier selection practices, supplier development practices and supplier integration practices were omitted from the regression equation since it was insignificant. This is because its probability value exceeded 5%, (0.201, 0.389 & 0.57). Supplier performance monitoring, Supplier performance measuring and supplier audit practices were found to be statistically significant since their probability values were less than 5%, (0.000, 0.002 & 0.021, respectively).

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter gives a summary of major study findings which have been discussed in line with the research objective which is to establish the relationship between SQM practices and OP of cement manufacturing firms in Kenya. Other sections covered include conclusion and recommendations and an outline of limitations and areas for further investigation.

#### **5.2 Summary of Findings**

Referencing the use of SQM practices, the findings established that supplier performance monitoring practices, supplier performance measuring; competitive supplier selection practices, supplier audit practices, supplier development practices and supplier integration practices were implemented by cement manufacturing firms. These findings are consistent to Sculli and Yeung (2015) who found that SQM practices were used to a large extent.

Regarding the challenges faced by cement manufacturing firms in the implementation of SQM practices in Kenya, the study established that cement manufacturing firms were confronted by several challenges to a great extent when implementing SQM practices: inadequate training and development programs, lack of regular supplier audits, high rate of turnover by employees, inadequate finances and resistance to change. These findings are in line with the observations of Ross et al. (2011), who established that most manufacturing firms faced challenges in implementation of SQM practices, and this impacted negatively on their operational performance.

These challenges were failure to sponsor employees in training and development programs, failure to audit suppliers regularly and high cases of employee turnover. In view of this, is a study by Quang et al. (2016) who concluded that inadequate finances and resistance to change were key obstacles that hindered implementation of SQM practices.

Concerning the relationship between SQM practices and OP, the findings established that the coefficient of determination was a good fit for the data hence a satisfactory predictor. Further, it was discovered that the analysis of variance was significant. Supplier performance monitoring, supplier performance measuring and supplier audit practices were significant. In line with this, Wambani (2017) found that the regression equation employed was significant. The study further revealed that SQM practices supplier performance measuring and supplier audit practices were statistically significant. It was further revealed that competitive supplier selection practices, supplier development practices and supplier integration practices were insignificant. These results contradict the observations by Kitheka and Mulwa (2013) who found that supplier integration practices and competitive supplier selection were significant.

### **5.3 Conclusion**

The study concludes that the commonly applied SQM practices by cement manufacturing firms include supplier performance monitoring, supplier performance measurement, competitive supplier selection, supplier development, supplier audit and supplier integration. The findings established that these practices were applied and was an indication that their use had been accepted by most cement manufacturing firms. These practices were commonly used to enhance quality of products, quality assurance, on-time delivery of products and services and reduced lead time.

It was established that the key challenges that hindered cement manufacturing firms from successful adoption and use of SQM practices included failure to sponsor employees to continuous training and development programs, failure to conduct regular supplier audits, high rates of employee turnover, limited finances and resistance to change.

Regression analysis established that the regression equation adopted in the study was reliable in explaining the link between SQM practices and OP. Overall regression model applied in the study was significant. Supplier performance monitoring, supplier performance measuring and supplier audit were positively linked to OP. Additionally, supplier; performance monitoring, performance measuring and supplier audit were found to be significant.

#### **5.4 Recommendations**

Cement companies should sponsor their employees to a continuous training and development program to develop skills and knowledge on innovation. This will boost employees' efficiency and effectiveness when implementing SQM practices. Benchmarking with other cement manufacturing firms globally will also give them a leverage on how to manage suppliers and increase efficiency in operations.

Executive management of cement manufacturing firms should provide adequate support in form of resources and policies. And provide an environment that is supportive for employees to participate in the implementation of SQM practices.

Finally, KAM should set policies that create an environment where cement companies can practice and uphold ethics in their business dealings. This will promote healthy competition among cement firms and boost consumer protection

### **5.5 Limitations for the Study**

Due to time and resource constraints; the researcher was limited in scope hence the findings obtained are limited to cement manufacturing firm. Hence, the findings cannot be utilized to generalize the whole manufacturing sector in Kenya.

The researcher has no control over data collection. Few respondents failed to complete filling up the questionnaires and one of them completely declined to fill in the questionnaires citing busy work schedules as the main reason.

### **5.7 Suggested Areas for Further Research**

Researchers should do a replica of this study to cover the whole manufacturing industry. This will give more accurate and reliable findings and a detailed review regarding the nature of the relationship established in a study. Moreover, a duplicate of this research in other countries particularly in the Sub-Saharan region can help in establishing the universality and relevance of SQM practices and its effect on OP.

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## APPENDICES

### APPENDIX I: RESEARCH QUESTIONNAIRE

#### Introduction

This questionnaire is designed for the sole purpose of collecting data on supplier quality management practices and operational performance of cement manufacturing firms in Kenya. Data collected will be treated with a high degree of privacy and its meant for academic purposes only.

#### SECTION A: GENERAL INFORMATION

1. How long has your organization been in operational in the cement industry in Kenya?

- (i). Less than 10 years [ ]
- (ii) More than 10 years [ ]

2. What is your position in this organization?

- 1. Head of Operations/Plant manager [ ]
- 2. Finance Manager [ ]
- 3. Supply Chain Manager [ ]
- 4. Quality Manager [ ]

3. How long have you been in this position?

- a) Less than 5 years [ ]
- b) Between 5 to 10 years [ ]
- c) Between 10 to 15 years [ ]
- d) Above 15 years [ ]

**SECTION B: EXTENT OF USE OF SUPPLIER QUALITY MANAGEMENT (SQM)**

4. Please indicate the extent to which SQM practices are used in your organization. Use the following rating: Tick appropriately. 1-Not used 2-Small Extent 3- Moderate extent 4-Great Extent 5-Very great extent

	<b>Supplier monitoring practices</b>	1	2	3	4	5
1.	Your organization makes decisions using important information to plan, direct and control organizational activities					
2.	Top management can signal and educate suppliers on key performance dimensions					
3.	Your organization maintains effective partnership by monitoring supplier					
4.	Your organization monitors supplier performance regularly					
5.	Your organization provides timely information to suppliers					
6.	Your organization communicates the buyer's expectations					
7.	Your organization aligns its relationship with operational and strategic goals of the buyer organization					
8.	Your organization uses information collected when measuring supplier performance					
	<b>Supplier Performance Measurement practice</b>					
1.	Your Organization has a supplier performance measurement process					
2.	Your organization measures supplier's performance regularly					
3.	Your organization measures quality, cost and delivery time					
4.	Your organization uses this practice to maintain long-term relationships with suppliers					
5.	Your Organization communicates the key performance measures with all suppliers					
6.	Your organization involves all stakeholders during the review					
7.	Your organization has a due diligence process for new suppliers					
8.	Your Organization gives feedback after review					

Please indicate the extent to which SQM practices are used in your organization. Use the following rating: Tick appropriately. 1-Not used 2-Small Extent 3- Moderate extent 4-Great Extent 5-Very great extent

	<b>Supplier Audit Practices</b>						
1.	Your organization can easily identify areas that needs improvement						
2.	Your organization adopts non-conformance supplier audit						
3.	Your organization has improved its relationship between suppliers and the customers						
4.	Your organization has formally improved its understanding of the requirements that are needed in the audit process						
5.	Your organization maintains transparency and traceability in its supply chain channel						
6.	Your organization maintains continuous improvement in quality delivery						
7.	Your organization can easily detect weakness in its supply chain						
8.	Your organization puts more emphasis on supplier corrective and preventive actions						
	<b>Supplier Development Practices</b>						
1.	Your organization relies on several activities to develop supplier capabilities						
2.	Your organizations react to competitive markets						
3.	Your organization has formally gained competitive advantage from initiatives such as short-product life cycles and technological innovations						
4.	Your organization invests heavily on supplier development program						
5.	Your organization shares both confidential and strategic data						
6.	Your organization agree on important aspects such as performance metrics with its stakeholders						
7.	Your organization adopts a dynamic governance structure that accommodates a continuous and long-term learning						
8.	Your organization has established partnerships with its supply chain stakeholders						
	<b>Supply Integration Practices</b>						
1.	Your organization uses supply chain integration						
2.	Your organization focuses on improving product designs						
3.	Your organization involves suppliers and buyers in supplier product development process						
4.	Your organization uses its suppliers to achieve cutting-edge technology						
5.	Your organization involves its suppliers during early stages of design and development						
6.	Your suppliers are fully responsible for the product designs						
7.	Use of supply source integration allows organization to minimize lead time						
8.	Your organization has formally recorded fewer recalls and customer complaints						
	<b>Competitive Supplier Selection Practices</b>						
1.	Your organization can decide whether to rely on single sourcing or multiple suppliers						
2.	Your organisation involves supply chain partners in supplier selection decisions						

3.	Your organisation considers both strategic and operational factors in its supplier selection decisions					
4.	Your organisation has a supplier rating team to determine the performance of suppliers					
5.	Your organisation is mainly concerned about the product durability and failure rate					
6.	Your organisation integrates suppliers in total quality management programme					
7.	Your organisation engages its suppliers in the needs of their clients					
8.	The organisation evaluates its supplier's performance with a strong bias on the supplier profile.					

**SECTION C: CHALLENGES INVOLVED IN THE IMPLEMENTATION OF SQM Practices**

5. (a). List some of the challenges faced by your organizations in the implementation of SQM practices?

.....  
.....  
.....

b). From the list of challenges that you have given above which are the most popular challenges faced by your organization in the implementation of SQM practices

.....  
.....

**SECTION D. OPERATIONAL PERFORMANCE**

6. Kindly provide approximate figures on the parameters outlined in the table below.

Criterion	Unit of Measure	2015	2016	2017
Sales (cost)	Kshs. (m)			
Total average inventory (time)	No.			
Reduction in unit costs (cost)	Kshs. (m)			
Inventory cost (cost)	Kshs. (m)			
Inventory turnover ratio (time)	%			
Order lead time (time)	Days			
Range of products (time)	No.			
Cost efficiency (cost)	%			
Automation (quality)	%			
Safety measures (quality)	%			
ISO standards (quality)	%			

**THANK YOU ALL FOR YOUR PARTICIPATION**

## **APPENDIX II: CEMENT MANUFACTURING FIRMS IN KENYA**

1. Bamburi Cement Limited
2. East African Portland Cement Company
3. Mombasa Cement Limited
4. National Cement Company
5. Athi River Mining Limited
6. Savannah Cement Limited
7. Ndovu Cement Limited

**Source :( KAM, 2017)**