

**INFLUENCE OF QUALITY COSTS ON PERFORMANCE OF  
THE NATIONAL CEREALS AND PRODUCE BOARD IN  
KAPENGURIA, WEST POKOT COUNTY KENYA**

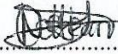
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**A Research Report submitted in Partial Fulfilment of the Requirements for the Award  
of the Degree of Master of Arts in Project Planning and Management, University of  
Nairobi.**

2019

## DECLARATION

I declare that this project report is my own work and has not been presented to any other university.



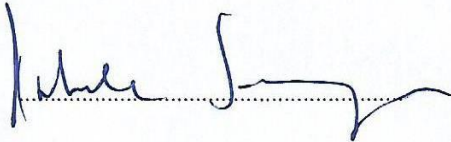
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## **DEDICATION**

I dedicate this piece of work to my dad Patrick Silali, my Mum Carolyne Silali and to my son Adriel Zemira for the financial and close support they gave me in conducting this study.

## **ACKNOWLEDGEMNT**

First and foremost I take this opportunity to acknowledge my supervisor Dr. Patrick Simiyu for according me the needed support and guidance in preparing this research Report. I also acknowledge my family who supported me both financially and morally. Lastly I wish to thank my course mates who gave me advice and supported me all through this work.

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## **ABBREVIATIONS AND ACRONYMS**

<b>ASQ</b>	American Society for Quality
<b>CoQ</b>	Costs of Quality
<b>GoK</b>	Government of Kenya
<b>ISO</b>	International Organization for Standardization
<b>KEBS</b>	Kenya Bureau of Standards
<b>KRC</b>	Kenya Red Cross
<b>NCPB</b>	National Cereals and produce board
<b>WFP</b>	World food program

## ABSTRACT

A project regardless of its size or magnitude must be completed under three constraints of cost, time and scope. The fourth constraint is usually quality which has become increasingly important as a result of globalization and the rise in business operating costs as well as competition at the global level. Quality comes at a price and project organization should embrace and recognize these costs and how they influence project performance. Cost of quality is simply the costs of conformance and the costs of nonconformance. The American Society for Quality identified four classes of costs of quality as Appraisal costs, Prevention costs, internal failure costs and external failure costs. Although most organizations have embraced the total quality management, very few have embraced the cost of quality concept which influences their performance largely. This study was aimed at investigating the influence of costs of quality on performance of state corporations a case of the National cereals and Produce Board. The study was guided by four objectives: To establish the extent to which internal failure costs influences performance of the NCPB, to assess the extent to which external failure costs influences performance of the NCPB, To determine the extent to which prevention costs influences performance of NCPB and to establish the extent to which appraisal costs influences performance of the NCPB in Kapenguria West Pokot county. Descriptive research design was used and before the actual study, a pilot study was conducted to ascertain content validity and the reliability of the questionnaires was tested through the split half technique. Data was collected from 225 sampled farmers out of 517 registered farmers. The questionnaire return rate was 77% and both descriptive and inferential analysis were used in analyzing data. From the study findings It was established that all the four costs of quality influences performance of the NCPB and failure to maintain quality of products was as a result of failing to implement the cost of quality approach. While the study findings indicated that Prevention costs had a higher influence with unstandardized coefficient of 13.0208, it was observed that NCPB was not paying attention to prevention costs activities due to logistical challenges. In this regard, the researcher recommends that NCPB should invest more in prevention costs activities for a favorable influence to be achieved.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1. Background of the study**

A project however big or small must be categorized into cost, time and scope. The fourth constraint is usually quality. For an organization to be competitive, quality must be taken into consideration. Globally, quality has been considered as a critical success factor for achieving competitiveness. Despite this fact, the cost of quality approach has not been fully appreciated by organizations (Schiffauerova & Thompson, 2006). Quality costing is an increasingly important issue in the debate over quality and its importance cannot be down played. It is imperative to understand that in order to have increased production and reduced costs one has to have a good quality and thus increased sales, market penetration and hence higher profits. Chiadamrong (2003) observes that cost of quality (CoQ) is an all-inclusive system, not a fragmentary tool.

Quality cost directly relates to return on investment (Jaju et al., 2007). It has however been observed that lack of top level management's commitment is the main reason as to why organizations do not systematically track costs of quality (Sower & Quarles, 2007). In addition, Harrington observes that a company can improve its performance by cutting on poor costs of quality. Companies are dealing with a number of problems such as sales going down, operating costs raising and customers becoming demanding and selective over quality. In this regard, organizations have a critical responsibility of maintaining profitability while improving on their quality. Projects are using different types of quality programs to increase internal and external customer satisfaction thus reducing costs of quality.

In Kenya, The cereal industry has become increasingly complex and competitive in the recent years. The National Cereals and Produce board (NCPB) was established with a mandate of buying and selling cereals to build strong national strategic reserves (Nyoro 2005). It buys and sells maize at determined prices thus stabilizing maize prices alongside establishing a maize reserve. Apart from this, NCPB is responsible for purchasing maize for relief purposes.

NCPB has been purchasing most maize from local farmers at a higher price compared to the market prices thus raising maize market prices by 18% (Jayne 2005). There has been cases of unfaithfulness between NCPB and farmers. In addition, Misoi in 2011 indicated that Kenya loses 20% of its grain output due to poor grain handling; there is a shortage of 30% of maize supply and price increase of more than 100% thus making NCPB lose its competitive advantage to the commercial dealers.

In 2006, large scale maize millers rejected maize from the NCPB claiming it was unfit for human consumption. These millers cited high moisture contents, infestation and a flatoxin levels were also outside the specification. In the NCPB strategic plan, one of the reasons the corporation failed to achieve its goal has been mentioned as the negative publicity, inadequate staff training and growing competition.

According to an article by the Standard News paper on 15<sup>th</sup> February 2019, NCPB turned away farmers whose maize did not meet quality standard. The article further indicates that unlike in the past, Farmers delivering maize have started to be vetted and a list of suppliers kept for future references.

There is a close relationship between quality cost and organization efficiency. Efficiency is the ability to convert input to the output the smallest cost as indicated by Hilton et al, (2008). Without a clear indication of the measure of costs of quality, managers can not

be well informed thus can not make decisions pertaining quality. Viger and Anandarajan (1999) indicated that leaders who are well informed on quality costs can make informed decisions compared to those not informed.

Organizations competitiveness is damaged by quality related costs of correcting, redoing and apologizing to customers. Total quality Management is becoming an overly increasing area in strategic management with focus on costs of quality of organizations.

Omachonu,Ross (2004), notes that the most important issue to improve the competitiveness of any organization is to control and reduce costs of quality. Brah (2000) holds that operational performance is measured by the organization performance, customer satisfaction, financial performance and the effectiveness of the product quality. On the same note, Birch (2001) gives various indications of performance whereby quality cost is measured in terms of the budget against actual expenditure, the differences and the profits made. It has become increasingly clear that costs of quality management is key to the performance of an organization in the service and product industry.

## **1.2. Statement of the Problem**

While quality has been considered as a critical success factor for achieving competitiveness, the cost of quality approach has not been fully appreciated (Schiffauerova & Thompson, 2006). Quality costing is an increasingly important issue in the debate over quality and its importance can not be down played. Most programmes have embraced quality as a key aspect for customer satisfaction and they consider it a critical success factor for gaining a competitive advantage over rivals. While seeking to improve quality, it is important to consider the costs of quality and how they can be minimized. It is however impossible to reduce costs if they have not been identified and measured. Due to globalization and the rise in business operating costs as well as competition, it is becoming hard for organizations to maintain competitive advantage on prices alone but consider costs of quality as well.

There have been numerous reports on the failure of NCPB to purchase produce from farmers due to its dismal performance in relation to quality of its maize and fertilizer. The reason for this dismal performance has not been established and no empirical study has shown why the performance is poor. This has prompted the need to establish how various costs of quality influences performance according to recent reports, in 2006 for instance; large millers refused maize from NCPB due to being contaminated and not meeting the moisture specification. In 2010, 5 million bags of maize were reported to be contaminated and had aflotaxin. Similarly in 2018, Kenya bureau of standards cited that 4 million bags of maize in NCPB's silos were contaminated and not suitable for consumption. Such negative reports are largely related to costs of quality which is evident they are influencing NCPB's performance. This study therefore investigates how the various costs of quality have influenced NCPB's performance in Kapengria West Pokot County.



### **1.3. Purpose of the Study**

This study wanted to establish the influence of costs of quality on the performance of the National Cereals and Produce Board in Kapenguria, West Pokot County, Kenya

### **1.4. Objectives of the Study**

- i. To determine the extent to which Internal failure costs influence the performance of NCPB in Kapenguria, West Pokot County.
- ii. To assess the extent to which External failure costs influence the performance of NCPB in Kapenguria, West Pokot County.
- iii. To find out the extent to which Prevention costs influence the performance of NCPB in Kapenguria, West Pokot County.
- iv. To establish the extent to which appraisal costs influence the performance of NCPB in Kapenguria, West Pokot County.

### **1.5 Research Questions**

- i. Does internal failure costs influence the performance of the NCPB in Kapenguria, West Pokot County?
- ii. Does External failure costs influence the performance of the NCPB in Kapenguria, West Pokot County?
- iii. Does Prevention costs influence the performance of the NCPB in Kapenguria, West Pokot County?
- iv. Does Appraisal costs influence the performance of the NCPB in Kapenguria, West Pokot County?

### **1.6. Research Hypotheses**

The study was guided by the following hypotheses.

- i. Ho<sub>1</sub> There is no significant relationship between internal failure costs and Performance of the NCPB.
- ii. Ho<sub>2</sub> There is no significant relationship between external failure costs and performance of the NCPB
- iii. Ho<sub>3</sub> There is no significant relationship between Prevention costs and performance of the NCPB
- iv. Ho<sub>4</sub> there is no significant relationship between appraisal costs and performance of the NCPB.

### **1.7. Significance of the Study**

The information collected and the recommendations made from this study will add value to the existing theories of cost of quality and give an overview on how the different cost of quality dimensions influence the performance of state corporations. Management of the National Cereals and Produce Board may use this study to audit their processes while putting into consideration the cost of quality concept and its influence on performance. Understanding the cost of quality is critical because it affects projects and thus organizations performance.

The study facilitate formation of policies in the grain sector which will form a standard guide to all organizations in line to get used and implement the cost of quality system for evaluating organizational performance.

### **1.8. Delimitations of the study**

This research study was done at the National Cereals and Produce Board in Kapenguria, West Pokot County. It was based on accessible population comprising of the center manager, Produce inspector, store clerk and the records clerk. Data was only collected from NCPBs customers within West Pokot county who are the major consumers of the NCPB produce. No other individual took part in this research study.

### **1.9. Limitations of the study**

In conducting this study, various challenges were faced and among them being language barrier. This barrier was overcome through the help of the research assistant who is a native of West Pokot and understands the language. Another challenge faced was time constraints where by the NCPB staff kept referring the research to come another time due to their busy schedule. The researcher opted to stay the whole day at the NCPB waiting for the appropriate time to conduct the interviews.

### **1.10. Assumptions of the study**

The study was guided by the following assumptions

- i. Costs of quality influence the performance of the NCPB in Kapenguria West Pokot Kenya.
- ii. Respondents will provide accurate information that will lead to achieving the study objectives.
- iii. The information collected from the respondents will be adequate and reliable

### **1.11. Definition of significant terms**

**Appraisal costs:** This has been used to refer to all those costs incurred by the organization in checking whether the product meets the quality specifications. In state corporations like NCPB, this could include such costs as inspection of cereals, hiring produce inspectors and costs of auditing

**Cost** refers to the price of providing goods and services.

**External failure cost.** This has been used to refer to all costs incurred when product does not meet customers' requirements or specifications after being delivered. In this case, external failure costs includes costs of rejected bags of maize, number of customers lost, costs of responding and handling customer complaints.

**Internal failure cost.** This has been used to refer to all costs incurred when products, components and material fail to meet quality specifications before being delivered to customers. In the NCPB case, this costs includes bags of grains disposed off, re-drying and regarding costs.

**Prevention Costs:** this has been used to refer to all the costs incurred by an organization while trying to reduce errors and defects on the product before reaching the end users. In the NCPB case this could include such costs as training employees on quality, Routine fumigation and routine aeration.

**Performance.** Has been used in this study to refer to effectiveness and efficiency in the operations of the project organization for higher returns on investment and it includes the competitive edge of an organization

**Quality** is a characteristic of a product or service that has the ability to influence customers' buying behavior (Rahnamaryroodposhti 2008). If a customer's expectations are met, the product/ service is considered of high quality.

**Quality Cost:** These are costs associated with creation of quality, evaluation of conformance with quality and consequences of failure to meet service specification both within the organization and outside the organization. Quality costs include Internal failure costs, External quality costs, Appraisal costs and Prevention costs.

#### **1.12. Organization of the Study**

This study is categorized in five chapters with each chapter focusing on specific areas of the study. Chapter one covers the introduction of the gap and ends with definitions of basic terms used in the study. Chapter two reviews the past literatures to the study and brings out the conceptualization of the study area. Chapter three brings out the research methodology used in pursuit of realizing the set objectives. Chapter four brings out data analysis, interpretation and discussion of findings while Chapter five gives the summary of findings, conclusion, suggestions and the recommendation. The final section of the report summarizes the references of the cited materials and the appendices.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0. Introduction**

This chapter presents the concept of costs of quality and how they influence the performance of state corporations with an analysis on the National Cereals and Produce Board (NCPB). It further gives reviewed literature related to the study area as brought by the research objectives. A detailed conceptual framework has been used to demonstrate the relationships between the variables and an operationalization table of the variables presented as well as the knowledge gap determined.

#### **2.1. Concepts of Costs of Quality and performance of the NCPB**

The cost of quality is an aspect that has been used since the past several years (Khozein. A., Mohammadi. J., Zarmehri. M. 2013). In 1961, The American Society for Quality (ASQ) established a team whose mandate was to manage costs of quality in the Quality Management Division. This aspect was however not vocal until 1979 when Crosby. In Philip's book titled Quality is Free the information is included. Crosby proposed various systems that can facilitate quality standards among them the AS-9000, ISO 9000 and QS-9000

ASQ identified four (4) different classes of quality as External failure, internal failure costs, Prevention costs and Appraisal costs (Bemowski 1992). These classifications have since been accepted all over the world by different professions like those in accounting and quality and are being used in the International Standards. Sadly, despite this, many organizations down play costs of quality and they rarely calculate it independently but include it as the product costs (Shepherd .N 2001)

Cost of quality influences the quality of products which to a large extent satisfies the customers' needs and results in improved organizational performance. According to studies by Saijala, Bisak & Viswanadhan (2015), cost of quality were identified as those expenses incurred by organizations in achieving good quality while maintaining poor quality throughout organizations operations to attain customer satisfaction.

Philip B Crosby in his book points out that the cost of quality has two dimensions that is the cost of good quality simply put cost of conformance and cost of poor quality simply put as cost of non conformance. Costs of good quality are further categorized as internal and external costs while costs of poor quality are further categorized as appraisal costs and prevention costs.

Due to globalization and the rise in business operating costs as well as competition, organizations will have a difficult time competing over prices alone. As a result, organizations will have an extra task of upholding their competitiveness on costs and quality as well to meet the customers' requirements and expectations. Costs of quality thus plays an important role in calculating return on investments in organizations. In addition, cost of quality is a useful platform in reducing business costs while increasing organizational competitiveness. According to Omurgonulsen (2009), costs of quality alone do not improve quality. The implementation of costs of quality provides input and feedback to the quality systems that are responsible for quality improvement (Tsai and Hsu, 2010). Pires et al. (2013) found that the majority of Portuguese companies with ISO certified systems have failed to clearly identify and calculate quality related costs thus hindering management of organizational improvements. Yang. C(2008), notes that it is imperative to communicate costs of quality in financial languages for the Top Managers to see and communicate the benefit.

Krishnan.S(2006) noted that organizations are not well versed on cost of quality and as a result they most often fail to evaluate the various costs of quality. Harrington (1999) stresses on the need of measuring costs of quality to control it and gain useful information to facilitate decision making.

There is a close relationship between cost and organization efficiency. From this perspective, efficiency means the ability to convert input to the output with the lowest cost (Hilton *et al*, 2008). Organizations competitiveness is damaged by quality related costs of correcting, redoing and apologizing to customers. Total quality Management is becoming an overly increasing area in strategic management with focus on costs of quality of organizations.

Various approaches have been developed to maximize cost and quality in services and products. Kazaz (2005), indicates that there is an inverse relationship between prevention and appraisal efforts in relation to internal and external costs. To achieve product/ service quality, an organization must put into consideration all the costs associated with it and ensure this cost is minimized where possible (Vaxevanidis and Petropoulos, 2008).

Omachonu,Ross (2004), notes that the most important issue to improve the competitiveness of any organization is to control and reduce costs of quality. Brah (2000) holds that operational performance is determined by the organization performance, customer satisfaction, financial performance and the effectiveness of the product quality. On the same note, Birech (2001) gives various indications of performance whereby cost of quality is measured as the actual budget compared to the expenditure, the deviation, safety costs and contribution from profits.



According to studies by Sower E (2007), there is a strong relationship between costs of quality, maturation of a project's quality and organizational performance. It was established that external failure costs tend to decline as quality improves. The main idea behind the analysis of cost of quality is the linking of improvement activities with their related costs and customer satisfaction thus making it possible to reduce the costs of quality while increasing quality improvement benefits. A realistic estimate of CoQ is therefore essential to any quality initiative. Campanella (2003) observes that any quality management must have quality cost programs. If organizations analyze the cost of quality effectively, they can increase quality levels and minimize costs of quality by balancing costs and causes.

National Cereals and Produce Board (NCPB) was established in 1939 by the government in colonial time naming it the Maize and Produce Control Board to organize and regulate operations of the regional market. In 1979, the Kenyan Government put together the maize and Produce Board with the Wheat board and formed the current NCPB. This was aimed at streamlining management as well as handling and marketing grains. In 1985, NCPB act Cap 338 was enacted and this gave NCPB the mandate to purchase, store, market and manage cereals grains and other produce in the country.

In 2002 NCPB advanced into marketing various agricultural inputs like fertilizers and certified seeds as part of the strategy of improving on efficient cereal production through the use of affordable quality inputs. This move was accepted by a response from farmers' requirements and the need for the NCPB to use its extensive network which enabled it to move these essential inputs closer to the farmer. Currently, NCPB stabilizes the grains prices, logistics support services for strategic grain reserves and starvation break stocks and a grain trading organization. It has a total of 110 depots and silos

spread out across the county with a total storage capacity of 1.8 million metric tons of grain.

The National Cereals and Produce Board in Kenya is ISO 9000: 2008 certified to ensure quality management in its operations. Despite this there have been various losses both internally and externally as a result of poor cereal quality. NCPB has been purchasing most maize from local farmers at a higher price compared to the market prices thus raising maize market prices by 18% (Jayne 2005). There has been cases of unfaithfulness between NCPB and farmers. In addition, Misoi in 2011 indicates that due to poor grain handling, Kenya loses 20% of its grain output; there is a shortage of 30% of maize supply and price increase of more than 100% thus making NCPB lose its competitive advantage to the commercial dealers.

In 2006, large scale maize millers rejected maize from the NCPB claiming it was unfit for human consumption. These millers cited high moisture contents, infestation and aflatoxin levels were also outside the specification. In the NCPB strategic plan, one of the reasons the corporation failed to achieve its goal has been mentioned as the negative publicity, inadequate staff training and growing competition.

NCPB has a major role of controlling quality of all stocks entering the strategic reserves and maintaining quality until the maize is dispatched. This has however been a major challenge considering the prevalence of Aflatoxin in the country. All consignments of maize must be tested for aflatoxin. In 2010, five million bags were destroyed with 150,000 waiting to be disposed as well after the maize was found contaminated and not suitable for human consumption. The cost of this internal failure was shared between the ministry of Finance, NCPB and Ministry of Agriculture. Due to lack of sound food

quality controls in the country rejected aflatoxin stock usually finds its way into the animal and human food chain through more lenient maize buyers and millers

NCPB has put in place a strict quality control system which involves three different laboratory tests before food deliveries are accepted. While regulatory standards are in place to control aflatoxins they are often not adhered to and as a result, grains rejected by one buyer would still find their way to another unsuspecting buyer.

It is unlikely that the maize market in Kenya will be able to transform itself into a successful efficient value chain without addressing the problem of aflatoxins. WFP implements a reliable quality control system in its procurement of staples, which is comparable to that of the NCPB and the KRC. However when poor quality or aflatoxin infected maize is detected, the grains are rejected by the buyer, with the high risk that much of this reject grain is sold back into the system by unscrupulous buyers. Buyers such as World food programme (WFP) and Kenya red Cross (KRC) can work with the Kenya Bureau of Standards (KEBS) and notify them when there is a risk to food safety in the system.

Organizational performance is one concept that has evolved over time with different scholars having different views on what performance actually is. In the '50s organizational performance was defined as the extent to which organizations fulfilled their objectives where evaluation was focused on work, people and organizational structure. In the 60s and 70s performance was defined as an organization's ability to exploit its environment for accessing and using the limited resources. Cooker (2002) states that performance predicts the success of an organization In addition, Li et al 2006 indicates in his study that organizational performance is directly related to its ability to achieve their strategic and financial objectives. Organizations performance has been for

a long time neglected while recent studies such as that of Katou 2008 looked at performance in terms of financial aspects. Stock (2000) studied organizational performance with regards to financial and market which focused on return on investments, sales, profits and market shares.

It is however important to look at the organizational performance wholly by measuring operational performance which encompasses financial performance, customer satisfaction and effectiveness of product quality (Brah et al 2000). Nidumolu (1996) & Jiang (2004), view project performance from the perspective of product and process performance. On the same note, Shenhar et al. (2001) suggested that project success should be based on efficiency in terms of costs and time, customer benefits from the final product and market opportunities. Dvir et al. (2006) divided project performance into project efficiency where he looked at performance in terms of cost, time and specification and project effectiveness where he viewed performance in relation to meeting customers' satisfaction and project team satisfaction.

Organizational performance is a multidimensional concept consisting of profitability, return on investment, customer retention and total sales as observed by Kim, Hoskisson & Wan (2004).

## **2.2. Internal failure costs and Performance of the NCPB**

Internal failure costs are those suffered by an organization as a result of products and services failing to meet the customers' needs. These costs usually manifest before the

service is delivered to external customers. These costs are associated with the processes, the products and materials that do not meet the quality standards.

Internal failure costs have a significant negative impact on a company's internal quality performance indicators such as defects, errors, scraps, rework, cost and even productivity (Deming 1986). These costs are incurred after appraisal activities identify defective products/ services

In the NCPB case, the organization wastes more resources due to internal failures cost. Some grains are disposed off as wastes, others are dried and others repacked. NCPB has a major role of controlling quality of all stocks entering the strategic reserves and maintaining quality until the maize is dispatched. This has however been a major challenge considering the prevalence of Aflatoxin in the country. In 2010, five million bags were destroyed with 150,000 waiting to be disposed as well after the maize was found contaminated and not suitable for human consumption. The cost of this internal failure was shared between the ministry of Finance, NCPB and Ministry of Agriculture. Similarly in 2018, KEBs cited that 4 million bags of maize in NCPB's silos are contaminated and unsuitable for consumption. This has resulted to a loss of 7.6 billions used in purchase of this maize.

Internal failure cost would have been avoided by investing in prevention and appraisal cost. It is the boards rule that all produce must undergo three tests before being accepted. However, due to lack of sound quality control measures, contaminated produce still finds its way into the strategic reserve and ends up being disposed off before reaching the intended customers.

### **2.3. External Failure costs and performance of the NCPB**

External failure costs are those suffered by the organization after delivery of products or services that do not meet the customers' needs. According to Gary (2000), these costs can be eliminated by avoiding flaws in products and services. External failure costs are more extensive because of the large amount of resources an organization can lose to correct them as well as because of the actual potential losses on sales and profits (Lin& Johnson 2004). External failure costs affects the future of businesses through customers being displeased, customers incurring higher costs for maintenance due to premature failure of the product/ Service delivered. A lot of time is wasted in the process as well. Kazaz (2004) observes that external failure costs can be eliminated through increasing prevention and appraisal costs.

In 2006, large scale maize millers rejected maize from the NCPB claiming it was unfit for human consumption. These millers cited high moisture contents; infestation and aflatoxin levels were also outside the specification. This has increased cases unfaithfulness between NCPB and its customers. In addition, Misoi in 2011 stated that Kenya loses 20% of productivity of its grains due to poor grain handling; there is a shortage of 30% of maize supply and price increase of more than 100% thus making NCPB lose its competitive advantage to the commercial dealers.

### **2.4. Prevention costs and Performance of NCPB**

Prevention costs are those costs incurred in the pursuit of preventing quality problems. These costs are brought through planning and incurred even before the actual operations

are carried out. These costs interplay at the design and implementation stage of quality management systems. These costs are associated with all the activities within the organization aimed at preventing poor quality.

Companies that need zero defect usually invest much in the prevention activities (Warren 1998). As prevention costs increase, defects as a result of poor quality reduces. In the NCPB, various prevention activities have been put in place to reduce wastes in the stored cereals. One of the most common prevention activity witnessed at the NCPB is the quality planning. Feighenbaum (1991) defines cost of quality planning as the process of planning production methods, procedures and instructions to ensure customer needs are met. At the NCPB, before cereals are taken in for storage and suppliers paid, they must be tested and inspected if they meet all the conditions. This is done to facilitate acquisition of quality cereals that will meet the customer's needs.

Apart from quality planning, NCPB also incurs purchasing costs. These includes all the costs incurred during purchase of cereals. It entails evaluating suppliers to ensure they are bringing produce that meets the quality standard. In addition to this, staff have to be trained to overcome errors and failures both at the supply, storage and even delivery.

NCPB has put in place a strict quality control system which involves three different laboratory tests before food deliveries are accepted. While regulatory standards are in place to control aflatoxins they are often not adhered to and as a result, grains rejected by one buyer would still find their way to another unsuspecting buyer.

According to an article by the Standard News paper on 15<sup>th</sup> February 2019, NCPB turned away farmers whose maize did not meet quality standard. The article further indicates that unlike in the past, Farmers delivering maize have started to be vetted and a

list of suppliers kept for future references. All these measures aims at controlling quality of grains getting into the strategic reserves.

## **2.5. Appraisal costs and Performance of NCPB**

Appraisal costs are those costs incurred by the organization as a result of controlling products and services to ensure they are of high quality and meets the customers' needs. Appraisal costs are majorly for monitoring and evaluating quality activities. They are usually tied to suppliers, products, processes and services to ensure they conform to requirements. Giakatis (2000) observes that appraisal costs are associated with all the activities aimed at testing and inspecting products and services to ensure they conform to customer needs. The more the inspection and tests carried out, the higher the appraisal costs.

At NCPB, appraisal activities are in the form of testing and inspecting purchased cereals. This requires time, inspectors and testers. To minimize internal and external failure costs, NCPB has put in place a strict quality control system which involves three different laboratory tests before food deliveries are accepted. While regulatory standards are in place to control aflatoxins they are often not adhered to and as a result, grains rejected by one buyer would still find their way to another unsuspecting buyer thus leading to both internal and external failure costs.

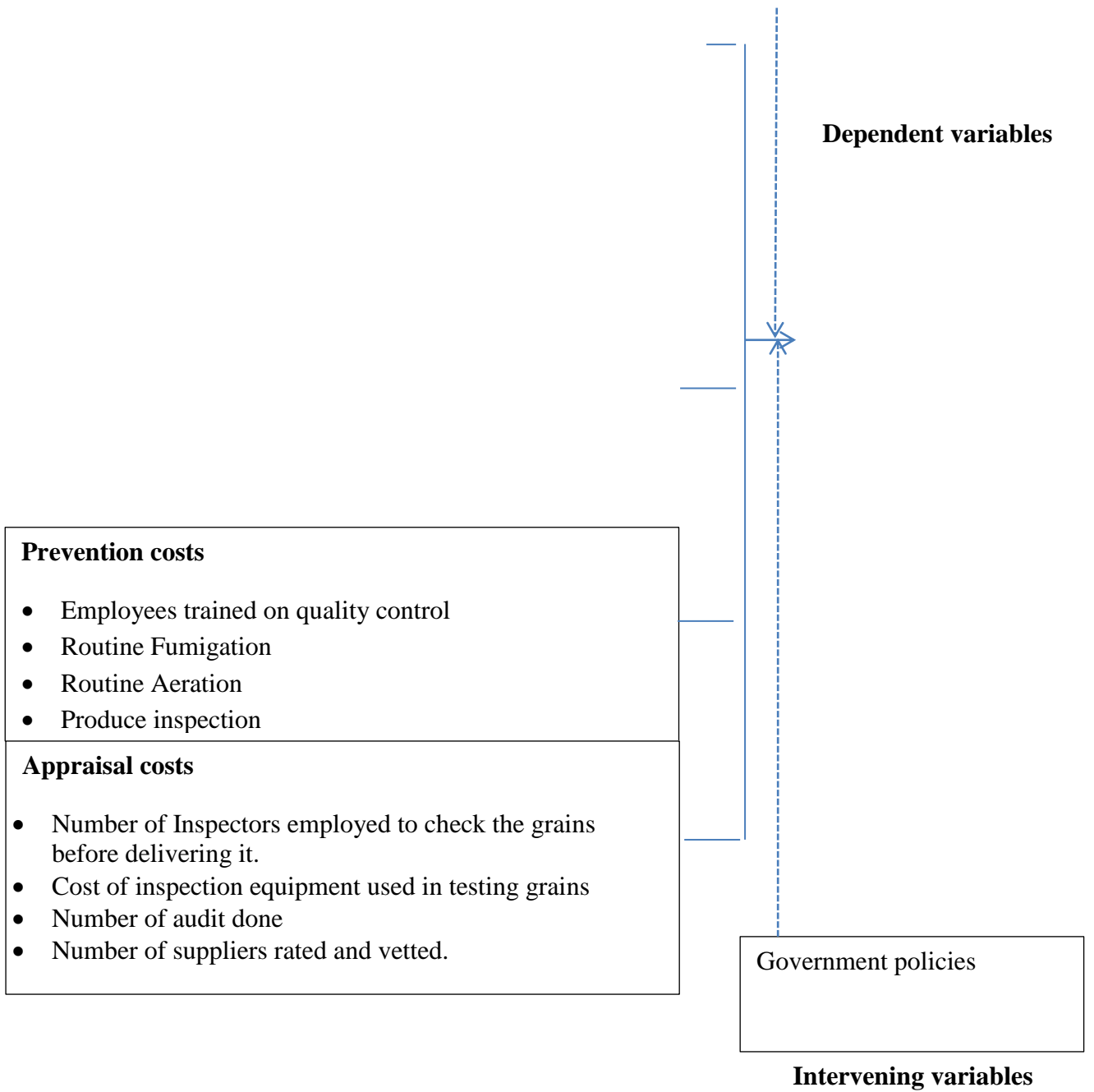
## **2.6. Theoretical Framework**



This study is based on the American Society for Quality (ASQ) which identified and classified costs of quality as internal failure costs, external failure costs, prevention costs and appraisal costs. The study also borrowed from Joseph Juran’s theory of Total quality management (1951) as cited by Edgemna (2006). This theory categorized quality in reference to meeting customers’ needs thus leading to income generation. The main aim is to produce quality products and services to meet the customers’ needs thus increasing the overall income through increased sales. To get the desired quality, investments have to be made thus increasing the costs. The second category sees quality as a form of eliminating insufficiencies and mistakes that leads to reworking the products and customers’ disappointments. When products are of high quality, they satisfy the customers thus making the organization gain a competitive advantage over its rivals, increase sales and income as well as the market shares (Edgeman & Bergquist 2006). Good value as a result of absence of errors makes organizations limit wastes, errors and customers dissatisfaction thus making good value cheap. Juran (1951) as quoted by Madu (2012), quality improvement is tied on the trilogy of quality planning, quality control and quality improvement. Organizations have the responsibility of identifying their customers, their needs and making products or services to meet the identified needs. Organizations should evaluate performance and relate it to value needs then work on nonconformities. Quality improvement calls for demonstrating needs, establishing infrastructure, preparing project teams and making available the necessary resources. This is closely related to appraisal and prevention costs of quality. By investing in these costs and focusing on the quality trilogy, NCPB will minimize both the internal and external failure costs by a great magnitude.

## 2.7. Conceptual Framework of the Study





## **2.8. Knowledge Gap**

As a result of globalization and the rise in business operating costs as well as competition, organizations have a difficult time competing over prices alone. As a result, organizations have an extra task of upholding their competitiveness on costs and quality as well to meet the customers' requirements and expectations. Although Many organizations have embraced the Total Quality Management concept, they have failed to give cost of quality the attention it requires. This has been contributed by the scarce research materials available for managers and implementing teams. Despite the wide range of studies relating Total quality management to organizations performance, very few studies have been conducted on how cost of quality influences organizational performance (Kaynak 2003). Even at this many organizations are losing millions of shillings due to quality related issues. The National Cereals and Produce Board in Kenya is ISO 9000: 2008 certified to ensure quality management in its operations. Despite this there have been various loses both internally and externally as a result of poor cereal quality. In 2010, five million bags of maize were found contaminated and not suitable for human consumption similarly in 2018, Kenya Bureau of standards (Kebs) cited that four million bags of maize in different NCPB silos were contaminated and unfit for consumption. This alone accounts to 7.6 billion lost according to an article by standard newspaper. It is evident that project organizations are losing too much due to quality related challenges. This and many more scenarios has made it necessary to carry out this study to find out why NCPB is suffering quality related loses and how implementing the four costs of quality will reduce these loses.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Introduction**

This chapter is a detailed over view of the methodological procedures used in the study. It describes the research design, study population, sampling and sample size, research instruments, reliability and validity of data collection tools, data collection procedure data analysis techniques, ethical considerations and operationalization of variables table are all covered in this chapter.

#### **3.2. Research design**

This study employed the use of descriptive survey design. This design provided a general picture of the various costs of quality influencing organizational performance. Data collected from entire population is analyzed through design or a sub set at a specific time and point to answer the research questions. Descriptive design facilitated the incorporation of both quantitative and qualitative features within this study. It made it possible for me to collect and analyze data on cost of quality among the different populations of the National cereal and produce board.

#### **3.3. Target Population.**

According to a study by Kombo and Tromb (2013), population refers to the entire group of subjects with common characteristics. The population for this study will comprise 517 registered farmers who supply their produce to the board and purchases fertilizers from the board as identified by the ministry of Agriculture West Pokot

County. Three key NCPB staff that is the produce inspector, center manager and the store clerk were also identified as being part of the population for the study. This population was selected because it comprised of those who carry out most duties and have clear knowledge and the needed information. Customers were also key because performance is tied to customer satisfaction. These farmers have a direct connection to the NCPB through supplying their produce and purchasing fertilizers.

### 3.4. Sample Size and Sampling procedure

A sample is a smaller group obtained from the accessible population (Mugenda and Mugenda 1999). In this study purpose sampling will be used in identifying the NCPB staff members while Yamane Taro's formula will be used in calculating the study sample from the 517 farmers where

$$n = \frac{N}{1+N(e)^2}$$

Where n is the sample size, N the population size and e the precision level (0.05).

Thus the sample sizes to be used are as follows

Clusters	Population	Sample
Registered Farmers	517	225
Center Manager	1	1
Produce Inspector	1	1
Store clerk	1	1
<b>Totals</b>		228

National Cereals and Produce Board.

### **3.5. Research Instruments**

This study utilized both qualitative and quantitative data collection methods. As a result, semi structured questionnaires and Interview guides were used in data collection. The use of these three instruments was to facilitate triangulation and facilitate deeper understanding of the costs of quality and how they influence performance of the NCPB. This varied data collection methods ensured that the limitations of one instrument is balanced by the strengths of the other (Bernad, 2002; Turner 2010).

A research questionnaire was used in this study to get the views of the customers on how costs of quality influences performance of the NCPB. The questionnaire had six sections with the first section covering the demographic information of the respondents, four sections focusing on the study objectives and the last section had means of measuring the dependent variable. Through the use of questionnaires, I collected data from a large number of respondents easily. Interview schedule was also useful in this study as it made it possible to get more detailed information to answer the four study objectives. This instrument was used to collect data from the produce inspector, the center manager and the stores clerk of the Kapenguria NCPB.

### **3.6. Piloting research Instruments**

To ensure the validity of the research instruments, a pilot study was carried out in Trans-Nzoia's Kitale NCPB and 22 farmers were issued the research questionnaires. This exercise was meant to assess content validity, which was ascertained through analyzing the responses from the 22 farmers and it emerged that all of them were giving similar

responses. Feedback from the questionnaire showed that some items were unclear and were thus improved. The layout and the length of the questionnaire was also assessed to ensure responding does not take too much time. Further more, content validity testing was authenticated by the research supervisor. This is in line with the study that showed that validity can be ascertained by an expert (Best and Kan 2007). In line with Kirlinger (2009), the pilot study reached 10% of the study population.

### **3.7. Validity of Instruments**

Orodho. A, (2009) observes validity in research as a question of how the research findings represents the reality. Validity refers to the extent to which findings from the study reflects the area being studied. Validity ensures the data collected is appropriate, meaningful and meets the intended needs. Validity was ascertained from a pilot study to pre test the instruments. The supervisor confirmed the accuracy of the instruments before the pilot study and after to reduce the likelihood of systematic errors in data collected.

### **3.8. Reliability of Instruments**

Reliability is used to show closeness of results obtained from the study are consistent over time. The questionnaire instrument reliability was established through the split half technique. According to Schumaker & Mcmillan 2010, the results of the split half represents the measure to which two halves of the test are consistent. The even and the odd numbered items were scored separately and Pearsons correlation coefficient formula was used to determine the correlation coefficient ( $r$ ) where  $r$  obtained was 0.8 representing a half of the reliability coefficient of the instrument. This is a substantial relationship as indicated by (Best and Kan 2007) and the questionnaire instrument was

found to be a reliable tool in measuring the influence of costs of quality on the performance of NCPB.

### **3.9. Data analysis Techniques.**

Kerlinger (2009) conceptualize data analysis as the process of organizing, arranging and giving meaning to data. In this study, all the collected data was entered into excel sheets and analyzed using statistical package for social scientists (SPSS). Since the obtained data was both qualitative and quantitative, both descriptive and inferential statistics were used in analyzing the collected data. The data has been presented in tables and in narratives to make it easy for all to understand.

### **3.10. Ethical Considerations.**

Ethics is a branch of Philosophy that looks at ones conduct and acts as a guide to ones behavior ( Mugenda &Mugenda 2003). Despite the value of knowledge acquired through research, it is important to note that knowledge cannot be pursued at the expense of human dignity. Before carrying out this study, permission was sought from NACOSTI and a notification letter was also pre sent to the Kapenguria NCPB to inform them of this study. Respondents were also briefed on the nature of the study and participation was voluntarily. Confidentiality was upheld and the study avoided the use of names and any other identifiers.



Objectives

Variables

Scale of  
Measurement

Type of Analysis

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### **3.11. Operationalization of variables table**

To Investigate the extent to which Internal failure costs influence the performance of NCPB	Internal failure costs	Ordinal. Nominal Ratio	Descriptive  Inferential
To assess the extent to which External failure costs influence the performamnce of NCPB	External failure costs	Ordinal. nominal Ratio	Descriptive  Inferential
To Examine the extent to which Prevention costs influence the performance of NCPB	Prevention Costs	Ordinal. nominal Ratio	Descriptive  Inferential
To assess the extent to which appraisal costs influence the performance of NCPB.	Appraisal costs	Ordinal. nominal Ratio	Descriptive  Inferential

Table 3.2 Operationalization of Variables table

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**CHAPTER FOUR:**  
**DATA PRESENTATION, ANALYSIS, INTERPRETATION AND**  
**DISCUSSION**

## 4.1 Introduction

Chapter four provides the results of the study which have been analyzed and discussed. It presents the questionnaire response rate, respondents back ground information and the findings on internal failure costs, external failure costs, prevention costs and appraisal costs in relation to performance of the NCPB. The findings are presented in themes according to the study objectives.

## 4.2. Questionnaire Return Rate

**Table 4.2. Questionnaire Return rate**

	Frequency	Percentage	Cumulative Percentage
Questionnaires administered	225	100	100
Questionnaires Returned	173	77	77
Questionnaires Not Returned	52	23	23

Out of the 225 items administered, 173 were responded to translating to 77% response rate. On the other hand, 23% of the administered items were not returned hence they were not considered during analysis of the findings. 77% of questionnaire response rate is adequate for analysis.

## 4.3. Demographic Characteristics of the Respondents

Analysis of the respondents was carried out based on their occupation, their gender and the locations they come from in West Pokot county, Kenya. It was important to

determine the respondent's occupation and how they are linked to NCPB. Gender was also important because the study targeted both genders hence both female and male were encouraged to take part in this study.

#### **4.3.1 Distribution of respondents by Occupation.**

Occupation	Frequency	Percentage	Cumulative percentage
Farmers	109	63.0	63.0
Traders	64	37.0	37.0
Totals	173	100.0	100.0

The study found out that most of the respondents were farmers with a frequency of 109 translating to 63%. These were the direct suppliers of maize to NCPB and direct buyers of fertilizers from NCPB. Apart from farmers and traders, the study utilized the center manager, a produce inspector and a store clerk to get more information through an interview guide.

#### **4.3. 2. Distribution Of respondents by their Location**

According to reports by the NCPB, Its clients are concentrated in six Locations as shown in the table 4.3.2

**Table 4.3.2. Distribution of respondents by location**

	Frequency	Percent	Valid Percent	Cumulative Percent
Kapenguria	48	27.7	27.7	27.7
Kapkoris	24	13.9	13.9	41.6
Keringet	25	14.5	14.5	56.1
Kishaunet	24	13.9	13.9	69.9
Mnagei	26	15.0	15.0	85.0
Talau	26	15.0	15.0	100.0
Total	173	100.0	100.0	

#### **4.3.3 Distribution of respondents by Gender**

This study targeted both genders hence both females and males were encouraged to take part in the study. This was aimed at getting diverse views since both men and women are engaged in farming activities and selling of the produce. From the NCPB records, it was evident that both genders supplied maize and purchased fertilizer.

#### **4.3.3 Distribution of respondents by gender**

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
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Female	79	45.7	45.7	45.7
Male	94	54.3	54.3	100.0
Total	173	100.0	100.0	

The study found out that men formed the majority of the respondents with a 54.3% while female respondents formed the 45.7%. From these findings the gender ratio was almost balanced but still shows that men are the ones responsible for selling large farm produce and purchasing farm inputs.

#### **4.4. Influence of Internal failure Costs on performance of the NCPB in West Pokot County Kenya**

In line with the first objective of this study, the researcher examined the influence of internal failure costs on the performance of the national Cereals and Produce Board in Kapenguria, West Pokot County, Kenya. The respondents gave their views as shown in table 4.4.1

**Table 4.4.1 frequency distribution table of influence of internal failure costs on performance of the NCPB**

Responses	Frequency	Percentage	Cumulative Percentage
-----------	-----------	------------	-----------------------

No influence	10	5.8	5.8
Small influence	16	19.2	15.0
Neutral	20	11.6	26.6
influences	64	27.0	63.6
Highly influences	63	36.4	100
Totals	173	100	

From table 4.4.1, 27% and 36.4% of the respondents felt that internal failure costs have an influence on the performance of NCPB. Only 5.8% of the respondents felt it had no influence at all. This findings are consistent with Brah (2000) who in his findings observed that performance of an organization is directly dependent on product quality. From table 4.4.1, it is clear that without investing in reducing internal failure costs NCPB's performance continues to be dismal and therefore the state corporation continues to suffer negative publicity and fear of being disbanded.

The mean response score of the extent to which the various internal failure costs indicators influence performance of the NCPB has been indicated in table 4.4.2. The findings showed that the mean score ranged between 4.1 and 2.7 indicating the indicators influence is between moderate influence and low influence

**Table 4.4.2 The mean response score on influence of internal failure costs on performance of the NCPB.**

Internal failure costs activities	N	Min	Max	mean	Std.
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					Deviation
Grading cereals	173	1.00	5.00	4.5202	.90599
Disposing off contaminated produce	173	1.00	5.00	4.4740	0.87316
A lot of delays in delivering customers orders due to activities aimed at improving produce quality.	173	1.00	5.00	4.1098	1.02558
Re-drying Cereals to meet moisture specification contents	173	1.00	5.00	3.9075	1.18743
Use of packaging that does not indicate manufacture dates and expire dates	173	1.00	5.00	2.7803	1.02768

**Legend: Max= maximum, Min=Minimum, Std=Standard, N analyzed cases**

From table 4.4.2, grading of cereals had the highest mean of 4.5202 followed closely by disposing of contaminated produce which had a mean of 4.4740. These two activities are most common at the NCPB centers and they cost the corporation a lot of money and thus influences its performance in the long run. These findings are consistent to an article by the Daily Nation in 2010 that cited that five million bags of maize were destroyed by NCPB and some more 150,000 bags were awaiting to be disposed as well after the maize was found contaminated and not suitable for human consumption. Similarly, an interview with Kapenguria NCPB staffs showed that the corporation has been facing serious quality challenges that is influencing their performance. The store



clerk shared that they are always in a hurry to dispose off contaminated produce to unsuspecting consumers as relief food.

*In 2017, the government imported contaminated maize from South Africa and on arrival, it was realized that the maize was already contaminated due to high moisture contents and had molds already. This maize was shipped to Turkana as relief food. If this maize would have been intercepted by KEBs we would have lost our customers trust.*

This is evident that NCPB suffers major internal losses that are creating mistrust between this state corporation and its customers. From the findings, most respondents didn't see the need of changing how NCPB packages its products and this gave it the lowest mean of 2.7803 with a standard deviation of 1.02768.

In analyzing these findings, the researcher employed the use of null and alternative hypothesis for triangulation purposes. The hypothesis that guided this study were

**Ho<sub>1</sub>: There is no significant relationship between internal failure costs and Performance of the NCPB.**

**Ha<sub>1</sub>: There is a statistically significant relationship between internal failure costs and performance of the NCPB.**

For this reason, the study employed the use of Chi- square tests to test the relationship between internal failure costs and the performance of the NCPB and the results are as shown in the table 4.4.3

**Table 4.4.3. Chi square Tests results for internal failure costs and performance of the NCPB**

	values	df	Asymptoti Significance (2-sided)
Pearson Chi-square	19.544 <sup>a</sup>	4	.001
Likelihood ratio	24.107	4	.000
Linear by linear Association	.712	1	.399
N of valid Cases	173		

**Legend: df=degree of freedom, level of significance used is  $\leq 0.5$**

The Chi-square value for this test was 19.54. From the table 4.4.3, the probability of interest denoted as asymptotic significance is .001. This is less than the standard level of significance  $\leq$  and on this basis, the null hypothesis is rejected and the alternative hypothesis is thus upheld. From the findings, there is a statistically significant relationship between internal failure costs and the performance of the NCPB. This is also reflected in the frequencies where 127 respondents agreed that internal failure cost influences performance of the NCPB. The findings are also consistent with Deming's (1986) observations where he noted that internal failure costs have a significant negative influence on the performance of an organization and is usually indicated by scraps, rework, errors among others.

#### **4.5. Influence of External failure Costs on the Performance of the NCPB**

In determining the influence of external failure costs on performance of the NCPB, respondents were presented with a set of questions to respond to. The researcher ran both descriptive and inferential analysis to determine the relationship between External failure costs activities and the performance of the NCPB.

**Table 4.5.1 frequency distribution table of external failure costs and performance of the NCPB**

Responses	Frequency	Percentage	Cumulative Percentage
No influence	10	10.8	5.8
Small influence	7	9.0	9.8
Neutral	18	10.4	20.2
influences	73	32.2	62.4
Highly influences	65	37.6	100
Totals	173	100	

From table 4.5.1, a high percentage of 32.2 and 37.6 agreed that external failure costs influences performance of the NCPB. While 10.4 were neutral only 10.8% held contrary opinion that external failure costs have no influence on performance of the NCPB. The findings indicate that most of the respondents at 69.9 believe that external failure influences NCPB's performance and as such they measures should be taken to reduce them. These results are consistent with Harrington's report where he concluded that

companies can improve their performance by cutting on poor costs of quality such as internal failure costs and external failure costs.

Further analysis were carried out on how the different external failure costs activities influence performance of the NCPB and the results summarized as shown below.

**Table 4.5.2: The mean response score on influence of external failure costs on performance of the NCPB**

External failure costs activities	N	Min	Max	mean
Likelihood of switching from NCPB to another corporation given a chance.	173	1	4	2.9844
Customer satisfaction influences performance of the NCPB	173	1	2	1.9370
Customer complaints have a negative influence on performance of the NCPB	173	1	2	1.91133
Likelihood of recommending others to purchase from	173	1	2	1.4509

**Legend: N= number of valid cases, Min= minimum, max=maximum, Std=standard**

Findings from table 4.5.2 indicates that the mean score values ranged between 1.4 and 1.9 for maximum response of two and 2.9 for a maximum score of 4. Most respondents agreed that customer satisfaction influences performance of the NCPB thus a mean score of 1.9370. Similarly, respondent held the view that customer complaints had a

negative influence on NCPB's performance thus a mean of 1.91133. Based on the findings from table 4.5.2 respondents were not willing to recommend their friends and relatives to NCPB thus the lowest mean score of 1.4509. from the findings, we also see that likelihood of switching from NCPB to another corporation had a mean of 2.9844 indicating that given a chance, most of the respondents would switch from buying fertilizers and maize from NCPB to alternative suppliers. An interview with the center manager showed that they have lost customers as a result of supplying substandard quality produce.

*This year, many farmers have not purchased fertilizers from us because it came late. This was because last year, many farmers who had received the fertilizer complained that it did not help their crops and this affected their harvests. We later realized that the fertilizer we had supplied our farmers did not meet their soil needs and further more this fertilizer was meant for potatoes and not maize production. This made us lose our customers' trust and despite supplying it at lower prices, most of them have reduced the number of bags they purchase from us by almost a half. We have learnt that although they are buying this fertilizer, they no longer trust it and as a result, they are mixing it with the fertilizers from other vendors to avoid making loses like the previous year. This is a major blow because this year we have only sold half of what we sold the previous year and the rest is stocked in the stores.*

These views were held by the rest of the Kapenguria NCPB staff. The records clerk pointed out that this year they have only served half of the customers served last year. This is an indication that NCPB's sales are going down. Stock (2000) pointed out that organizational performance is tied on return on investment, sales, profits and market

shares. The fact that most farmers did not take fertilizer from NCPB despite subsidized prices shows that the corporation is losing its market share and customers prefer to pay more to receive good quality products. By having the fertilizer in the store shows that sales have gone down and there is a small return on investment which will consequently influence their performance.

For the purpose of Triangulation, the researcher employed the use of a null and an alternative hypothesis. The hypothesis that guided this study were

**Ho<sub>2</sub>: There is no significant relationship between external failure costs and performance of the NCPB**

**Ha<sub>2</sub>: There is a statistically significant relationship between external failure costs and performance of the NCPB.**

.Inferential analysis was made using the Chi-Square test and the findings are as shown in table 4.5.3

**Table 4.5.3. Chi square Tests results of external failure costs and performance of the NCPB**

	values	df	Asymptotic Significance (2-sided)
Pearson Chi-square	49.675 <sup>a</sup>	4	.000
Likelihood ratio	35.821	4	.000
Linear by linear Association	5.683	1	.017
N of valid Cases	173		

**Legend: df=degree of freedom, significance level adopted  $\leq 0.05$**

The chi-square value is 49.675 and the significance is .000. By the fact that the significance value is less than 0.05, it is evident that external failure costs influences performance of the NCPB and on this basis the null hypothesis is rejected and the alternative hypothesis upheld. These findings are in line with Jurans (1986) observations on quality trio logy. In quality planning, the customers needs must be established and the products tailored to meet this needs to ensure customer satisfaction and consequently customer loyalty which results in increased sales. Without focusing on the customer needs, NCPB will end up losing most of its clients despite the favorable prices it offers. There is therefore need of investing on customer satisfaction through quality planning and improvement to minimize external failure costs.

#### **4.6. Influence of Prevention Costs on the Performance of the NCPB**

173 respondents who filled the questionnaires and returned it on time for analysis shared their views on influence of prevention costs on performance of the NCPB. Table 4.6.1. gives an overview of the findings.

**Table 4.6.1 Frequency distribution table of influence of prevention costs on performance of the NCPB**

Responses	Frequency	Percentage	Cumulative percentage
No influence	15	8.7	8.7
Small influence	20	11.6	20.2
Neutral	5	2.9	23.1
Moderate Influence	27	15.6	38.7
High Influence	106	61.3	100
Total	173	100	

The findings indicate that 61.3% and 15.6% of the respondents held the views that prevention costs highly and moderately influences performance of the NCPB respectively. In this regard, 133 respondents felt that prevention costs influences performance of the NCPB while only 15 respondents translating to 8.7% had opposing views. From this findings, it is evident that if NCPB invests in prevention cost activities, produce quality will be improved and this will significantly improve their performance.

Further analysis was carried out to determine the extent to which prevention costs activities influence performance of the NCPB and the results are shown in table 4.6.2



**Table 4.6.2 The mean response score on influence of external failure costs on performance of the NCPB.**

Prevention costs activities	N	min	max	mean
<hr/>				
Extent to which Routine Fumigation influences performance of the NCPB	173	1	5	4.3353
Extent to which Routine Aeration influences performance of the NCPB	173	1	5	4.2948
Extent to which Staff Training on quality related issues influences performance of the NCPB	173	1	5	4.2890
Extent to which Produce inspection influences performance of the NCPB	173	1	5	4.2832

**Legend: Min= minimum, Max= maximum, N= number of total cases analyzed.**

Findings in table 4.6.2 indicates that the mean score values for the four prevention costs activities are closely related with the high highest mean being 4.34 and the lowest mean being 4.28. this indicates that the activities influences performance of the NCPB to a moderate extent. It is observed that routine fumigation had the highest mean score of 4.34. respondents felt that through fumigation, pests will be avoided thus the quality of the produce in the stores will be maintained. However, logistical challenges faced by NCPB has made it to fail in carry out fumigation on a regular basis due to lack of finances. From the interviews with NCPB staff, it is evident that they are facing financial challenges and this is affecting the corporation's performance because crucial activities have to be overlooked and in the long run the produce ends up infested by insects. The center manager shared that

*We are usually faced with financial challenges especially when the government fails to release funds on time. As a result we are forced to overlook some activities such as fumigation and even aeration because we do not have funds to make the purchases and even pay laborers. As a result some of the produce gets infested which affects its quality forcing us to dispose it off to unsuspecting consumers at subsidized price.*

In addition, while frequent aeration got a mean of 4.293, the store clerk shares that aeration equipment have broken down and this prevents the exercise from taking place. As a result most of the produce ends up discolored and termed unsuitable for human consumption.

*We get the best quality of produce from our suppliers but most of it gets spoilt while in our possession due to financial constraints. Our aeration*

*equipment have broken down and this makes it difficult to conduct this exercise as frequently as expected*

It is therefore evident from the findings that despite NCPB staffs being aware of the measures to be taken to ensure their produce remains of high quality, they are hindered by logistical challenges such as financial constraints. Campanella (2003) observes that any quality management must have quality cost programs and funds must be invested to minimize costs of poor quality to improve organizational performance. NCPB must learn to invest in prevention costs activities to minimize internal failure costs and external failure costs which are giving it a negative publicity.

For Triangulation Purposes the research formulated a null and an alternative hypothesis to guide the study and used chi square tests to analyze the findings. The study was guided by the following hypothesis

**Ho<sub>3</sub>: There is no significant relationship between prevention costs and performance of the NCPB.**

**Ha<sub>3</sub>: There is a statistically significant relationship between prevention costs and performance of the NCPB.**

To test this relationship a Chi- square test was conducted and the results are as shown in table 4.6.3.

**Table 4.6.3 Chi square test results on influence of prevention costs on performance of the NCPB.**

	values	df	Asymptoti Significance (2-sided)
Pearson Chi-square	9.554 <sup>a</sup>	4	.049
Likelihood ratio	13.627	4	.009
Linear by linear Association	7.729	1	.005
No of valid Cases	173		

**Legend. Df= degree of freedom, adopted significance level  $\leq 0.05$**

The Chi square value is 9.554 and the significance is 0.049 indicating that there is a relatively slight relationship between prevention costs and performance of the NCPB. On this basis the null hypothesis of chance is rejected and the alternative hypothesis upheld. This is an indication that prevention costs influence performance of NCPB and as such the corporation should invest in prevention costs activities to improve quality standards and gain a competitive advantage.

#### 4.7. Influence of Appraisal costs and Performance of the NCPB

Respondents were presented with a set of questions on appraisal costs to determine the extent to which they influence performance of the NCPB. The findings are as shown in table 4.7.1.

**Table 4.7.1** Frequency distribution table of appraisal costs and performance of the NCPB

Responses	Frequency	Percentage	Cumulative percentage
No influence	26	15.0	15.0
Small influence	5	2.9	17.9
Neutral	13	7.5	25.4
Moderate Influence	16	9.2	34.7
High Influence	113	65.3	100
Total	173	100	

Table 4.7.1 indicates that 65.3% of the respondents held the views that appraisal costs influences performance of the NCPB. Based on this findings, it is evident that most people think that by investing on appraisal activities, NCPB could be able to improve the quality of their produce and consequently minimize both the external and internal failure costs which are amounting to huge loses at the corporation

In addition to this, descriptive analysis was carried out based on the respondents' choices of response on the extent to which the different appraisal costs activities

influence performance of the NCPB. This analysis gave us mean scores for the various appraisal costs thus indicating the one with great influence and the one with minimal influence on the performance of the NCPB.

**4.7.2. Mean score values for Appraisal cost activities and performance of the NCPB**

Prevention costs activities	N	min	max	mean
<hr/>				
Extent to which hiring produce inspectors influence performance of the NCPB	173	1	5	4.1734
Extent to which servicing inspection equipment influences performance of the NCPB	173	1	5	4.1676
Extent to which supplier vetting influences performance of the NCPB	173	1	5	4.1387
Extent to which frequent audits influence performance of the NCPB	173	1	5	4.0867

**Legend: Min= minimum, Max=maximum, N=number of cases analyzed**

Findings from table 4.7.2 indicates that appraisal costs activities are closely related and their means range between 4.173 and 4.087 indicating that all the activities ranged between moderate extent and high extent in influencing performance of the NCPB.

hiring produce inspectors had the highest influence on performance of the NCPB with a mean score of 4.173. this indicates that produce inspectors have a great role of inspecting all the produce and vetting the ones to be taken into the NCPB's storage facilities. They are also responsible for carrying out routine audits and inspections on all the stored produce to ensure quality is maintained. Servicing of all inspection equipment to be in good working condition came second with a mean of 4.168. However due to logistical challenges, NCPB staffs share that most of their equipment have broken down and those working are not serviced regularly as is supposed to be. The produce inspector shares that

*Most of the equipment in this facility have broken down and are not in good working condition. Starting from the dryers to the fumigation equipment, none of them are working thus forcing us to turn to traditional methods and depend on chance when making critical decisions. Using this equipment in their current state results to faulty findings. Frequent servicing and even purchase of new ones is recommended but currently we cannot afford this due to financial constraints.*

While Campanella (2003) observes that any quality management must have quality cost programs and funds must be invested to minimize costs of poor quality to improve organizational performance, NCPB is way far from this because it is still facing logistical challenges.

The researcher was interested in formulating and testing hypotheses for triangulation purposes. A null and an alternative hypothesis were formulated as follows:

**Ho<sub>4</sub>:there is no significant relationship between appraisal costs and performance of the NCPB**

**Ha<sub>4</sub>:there is statistically significant relationship between appraisal costs and performance of the NCPB.**

Chi square test was used and the findings are as illustrated.

**Table 4.7.3 Chi square results for Appraisal costs and performance of the NCPB**

	values	df	Asymptoti Significance (2-sided)
Pearson Chi-square	35.974	4	.000
Likelihood ratio	49.950	4	.000
Linear by linear Association	16.207	1	.000
No of valid Cases	173		

**Legend: df=degree of freedom, adopted level of significance  $\leq 0.05$**

From table 4.7.3, the chi square value is 35.974 with a significance of 0.000. since the significance level is less than 0.05, we can conclude that there is a statistically significant relationship between appraisal costs and performance of the NCPB. On this basis the null hypothesis of chance is rejected and the alternative hypothesis upheld.

These costs are tied to suppliers, products processes and services to ensure they conform to specification. Through vetting suppliers and ensuring inspection equipment are in



good condition, NCPB is more likely to identify non conformities and take corrective measures on time to prevent external failure costs.

#### **4.8. Costs of quality and performance of the NCPB.**

The researcher ran an analysis to obtain the mean score of influence of costs of quality on the performance of the NCPB. The results are as shown in table 4.8.1

**Table 4.8.1 Mean score value of influence of costs of quality on performance of the NCPB**

	N	min	max	mean
Costs of quality influences performance of the NCPB	173	1	2	1.0809

**Legend: N= total number of cases analyzed, Min=minimum, Max= maximum**

**1=yes, 2=No.**

The mean shows that most of the respondents at 91.9% agreed that costs of quality influences performance of the NCPB. In this analysis, 1 signified agree and 2 signified disagree. From the given mean in table 4.8.1, it is evident that the mean shows a strong agreement that costs of quality influences performance of the NCPB. Respondents held a view that sub standard quality produce ends up raising costs of quality which results to dismal performance by the NCPB. NCPB staffs agree that they sometimes overlook certain aspects of quality which later on results to huge quality challenges and affects their general performance. The produce inspector observes that

*This year, the government released money for purchasing maize around March, as a result, most of the produce brought in had already been infested by insects. There is no remedy to already infested cereals but since we couldn't get one that had not been infested we took some. On the same note sometimes when a supplier brings in the produce, we usually check on coloration and degree of rot. We assume that a grain with less than 25% discoloration is still suitable for human consumption. However when we stock too much maize with this problem we end up losing too much when customers reject it and we have to sort and grade it again. It is also a challenge to store the produce. We are not supposed to hold cereals in the silos for more than six months, but due to lack of storage facilities, we are forced to overlook this and store the maize for more than a year. Due to the limited space, this maize ends up rotting and breaking during aeration.*

This is an indication that it is necessary for NCPB to set standards and invest in costs of quality like appraisal and prevention costs to improve its performance

A further analysis was carried out to determine the mean score values of the four costs of quality and their influence on performance of the NCPB. The results are presented in table 4.8.2

**Table 4.8.2 Mean score values of influence of costs of quality on the performance of the NCPB**

Costs of quality	N	Min	Max	mean	Rank
Prevention costs influences performance of the NCPB	173	1	5	4.0925	1
Appraisal costs influences performance of the NCPB	173	1	5	4.0694	2
External failure costs influences performance of the NCPB	173	1	5	4.0173	3
Internal failure costs influences performance of the NCPB	173	1	5	3.8902	4

**Legend N= number of cases analyzed, Min=minimum, Max= maximum**

Table 4.8.2 indicates the costs of qualities had mean scores of between 3.8902 and 4.0925.

This indicates that influence of costs of quality on performance of the NCPB ranges between small influence and moderate influence. prevention costs had the highest mean of 4.0925 indicating it had a moderate influence on performance of the NCPB. These findings are in line with Juran’s quality trio logy concept where he views quality planning as being more rooted in monitoring and evaluating quality which is more or less similar to prevention costs activities. Such activities like staff training, produce

inspection, routine aeration and fumigation are all key and without carrying them out, quality of the produce risks being affected. Without carrying out prevention activities, poor quality can not be corrected and this results in external and internal failure costs.

#### **4.9. Regression analysis of influence of costs of quality on performance of the NCPB**

Multiple regression analysis was carried out to develop a model of predicting the extent to which the independent variables namely internal failure costs  $X_1$ , external failure cost  $X_2$ , prevention costs  $X_3$  and appraisal costs  $X_4$  influence the depended variable which is the performance of the NCPB  $Y$ . findings of the multiple regression analysis are illustrated in table 4.9.1

**Table 4.9.1 Model Summary Table**

Model	R	R. square	Adjusted R square	Std Error of the estimate
1	0.760	0.577	0.559	5.69097

**Legend: R = the multiple correlation coefficient, R square= coefficient of determination, std=standard**

Table 4.9.1 gives an R value of 0.760 which is a good level of prediction. The R. square value is given as 0.577 and since it is the coefficient of determination, this findings

imply that costs of quality predicts 57.7% predictability in performance of the NCPB and therefore costs of quality have a 57.7% influence on performance of the NCPB.

An analysis of variance (ANOVA) was carried out to estimate the general differences in the means of internal failure costs, external failure costs, appraisal costs and prevention costs against performance of the NCPB. The findings are shown in table 4.9.2

**Table 4.9.2 ANOVA results on the influence of costs of quality on the performance of the NCPB**

model	Sum of squares	df	Mean squares	F	sig
regression	4196.483	4	1049.121	32.387	.000
residual	3076.778	95	32.387		
Total	7273.261	99			

**Legend Df sum of squares, F computed F value, sig= level of significance**  
**Independent variables: internal failure costs, external failure costs, prevention costs and appraisal costs. Dependent variable: performance of the NCPB**

Analysis of variance (ANOVA) gave a significance level of 0.000 which is less than 0.05. on this basis a conclusion was made that that there is statistically significant relationship between costs of quality and performance of the NCPB.

### 4.9.3 Estimated Model Coefficients

**Table 4.9.3 Relationships between costs of quality and performance of the NCPB**

Model	Unstandardized coefficients		Standardized	t	sig
	B	Std Error	coefficient Beta		
constant	87.830	6.3850		13.756	0.000
Internal failure costs	-0.1605	0.630	-0.176	-2.633	0.10
External failure costs	-0.3085	0.403	-0.677	-8.877	0.000
Prevention costs	13.0208	1.3044	0.748	9.824	0.000
Appraisal costs	0.1108	0.3020	0.252	3.667	0.000

Legend: std=standard, sig= significance level, t=value

The general formula of getting the equation to predict performance of the NCPB from internal failure costs, external failure costs, prevention costs and appraisal costs is obtained from table 4.9.3 as follows.

$$Y=87.830-(0.1605X_1)-(0.3085X_2) + (13028X_3) + (0.1108X_4)$$

Findings in table 4.9.3 gives an overview of the extent to which performance of the NCPB varies when influenced by one single cost of quality as the others are held constant. The unstandardized coefficient of internal failure costs is -0.1605 indicating that an increase in internal failure costs results to a negative performance of the NCPB by 0.1605. Similarly, the unstandardized coefficient of prevention costs is 13.0208 indicating that an increase in prevention costs improves the organizational performance by a margin of 13.0208. This shows that when NCPB invests more in prevention cost activities, costs of non conformity popularly known as internal failure costs and external failure costs are reduced and the organization performance improves.

Based on table 4.9.3 all the significance levels range from between 0.10 and 0.00. these values are less than 0.05 and therefore it is a clear indication that mutually internal failure costs, external failure costs, prevention costs and appraisal costs influences performance of the NCPB. This in in line with a report by Omachonu,Ross (2004) who noted that the most important issue to improve the competitiveness of any organization is to control and reduce costs of quality.

## **CHAPTER FIVE:**

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

#### **5.1 Introduction**

This chapter of the report provides the summary of the findings discussed in chapter four, a conclusion on the answerability of the research objectives and recommendations on the applicability of the study findings in addressing National Cereals and Produce Board (NCPB) quality improvement in relation to the concept of costs of quality and organizational performance.

#### **5.2 Summary of the findings**

This study was guided by the study objectives, the research questions and the formulated hypothesis. A summary of the findings has been presented on each objective independently to facilitate easy understanding and drawing of conclusions.

##### **5.2.1 Influence of Internal failure costs on the performance of NCPB in west Pokot County Kenya.**

In determining the influence of internal failure costs on performance of the NCPB, it was established that 63.4 % of the respondents agreed that internal failure costs influences performance of the NCPB. These results indicated that internal failure costs activities namely re-grading of cereals, disposing of contaminated produce, delays in delivering customer's orders while rectifying defects, re-drying of the cereals to meet the required moisture content specification and repackaging after rectifying quality hitches influences performance of the NCPB to a moderate extent.



The study indicated that the most influential internal failure cost was re-grading of cereals with a mean score value of 4.5 indicating that its influence ranged between moderate and high extent. The other internal failure costs activities scored mean values of between 4.47 and 2.78 indicating moderate to low influence.

Internal failure activities like re-grading, re-drying, re-packaging and disposal of non-conformities are what Deming (1986) refers to as rework, scrap and errors that ends up costing the organization a lot of money thus influencing its performance negatively. From a regression analysis carried out, the findings showed that internal failure costs had a -0.1605 influence on performance of the NCPB. This implies that an increase in internal failure costs results to 0.1605 decline in the performance of the NCPB.

While Crosby 1978 looks at quality in terms of zero defects, the study finds out that costs such as internal failure costs can only be minimized but not eradicated completely. This is because from the interviews with the store clerk, even when all measures have been taken, there must be breakages during movement of the produce and aeration and this results to re-grading and repackaging activities. The study findings were also in line with Farsijin, Kiamehr (2008) report that cited that internal failure costs comes into play when inspections are carried out and defects identified and need for corrective measures arises

## **5.2.2 Influence of External failure costs on the performance of NCPB in west Pokot County Kenya.**

The study findings indicated that most respondents at 69.8 held the view that external failure costs influences performance of the NCPB in a moderate to a high extent. Based on the findings it is evident that customers are not satisfied and given a chance, they are more likely to switch to other corporations thus a mean score value of 2.99. Respondents indicated their dissatisfaction with the quality of the produce purchased from NCPB and cited that due to this chances of recommending others to NCPB was low with a mean 1.45. These findings are closely related with Juran's & Gryna's (1993) study where they observed that quality implies fitness for use and customer satisfaction. When customer satisfaction is achieved, sales go up and cost of getting new customers, compensation and customer switching reduces.

The study found out that external failure costs had an unstandardized coefficient value of -0.3085 and a significance level of 0.000. This implies that there is a significant relationship between external failure costs and performance of the NCPB. A coefficient of -0.3085 indicates that an increase in external failure costs results to a decline in the performance of the NCPB by 0.3085.

The fact that likelihood of customers switching from NCPB to other corporations had a high mean of 2.99 indicates that there is a moderate likelihood of NCPB losing its customers to competitors. This observation is similar to Persic & Jankovic's (2006) report where they observed that external failure costs is associated with low quality which results in reduction in a company's market share and consequent loss of image. These sentiments have also been reflected in NCPB's strategic plan where the

corporation cites that it has faced a negative publicity that hindered it from achieving its goals.

### **5.2.3 Influence of Prevention costs on the performance of NCPB in west Pokot County Kenya.**

According to the study findings indicated in table 4.6.1, 76.9% of the respondents held the views that prevention cost analysis influences performance of the NCPB in a moderate to a large extent. From the various prevention cost activities presented namely: produce inspection, routine fumigation, routine aeration and staff trainings, mean scores of between 4.335 and 4.283 were obtained. This indicates that prevention costs activities influences performance of the NCPB to a moderate extent.

From a regression analysis results, prevention cost activity had the highest unstandardized coefficient of 13.2018 and a significance level of 0.000. This implies that prevention cost costs have a statistically significant relationship with performance of the NCPB and an increase investment in prevention costs results to a positive improvement in the performance of the NCPB.

The study findings were contrary to Deming's concept where he cites that improved quality lowers costs. From the findings, it is evident that an increase in prevention costs improves the quality and consequently improves the performance of the NCPB. It is clear that while Deming was making that observation, he was focusing on internal and external failure costs while ignoring prevention costs. While its noted that costs of prevention are quite affordable, the findings contradict this observation because logistical challenges at the NCPB hinders prevention activities and thus results to its dismal performance.

The findings were however in line with Juran's quality trio logy concept where he views quality planning as being more rooted in monitoring and evaluating quality which is more or less similar to prevention costs activities. Such activities like staff training, produce inspection, routine aeration and fumigation are all key and without carrying them out, quality of the produce risks being affected.

#### **5.2.4 Influence of Appraisal costs on the performance of NCPB in west Pokot County Kenya.**

The study established the influence of appraisal cost on the performance of the NCPB using various statistically methods. The findings in table 4.7.1 indicates that 74.5% of the respondents held that appraisal costs had an influence on the performance of the NCPB. Various appraisal activities among them frequent audits, vetting suppliers, routine servicing of inspection equipment and hiring produce inspectors were studied to determine their influence on performance of the NCPB.

The mean score values for the tested appraisal costs ranged between 4.17 and 4.087 indicating they had a moderate influence on the performance of NCPB. Respondents with a mean 4.173 felt that hiring produce inspectors was key in ensuring a professionally qualified person was carrying out the appraisal activities to identify defects and propose measures of correcting them. The findings also indicated that much attention has to be given to servicing inspection equipment to ensure they are giving correct appraisal results for sound decision making.

From the regression analysis carried out, appraisal costs had unstandardized coefficient value of 0.1108 and a significance level of 0.000. This indicates that it has a statistically significant relationship with performance of the NCPB and an increase in appraisal costs results to a slight positive improvement in the performance of the NCPB. This is

however contrary to Deming's concept of quality reduces costs because an increase in appraisal costs results in improved quality and consequent improved performance of the corporation.

### **5.3 Conclusion**

Quality and quality management have gained a lot of consideration in the past few years after it was established that costs related to quality consumes a significant portion of organization's resources thus influencing its performance (Juran & Gryna, 1993). It is therefore important to identify and determine the extent to which these costs influence performances of organizations for companies to get insights on how to implement them. The study investigated the influence of internal failure costs, external failure costs, prevention costs and appraisal costs in relation to performance of the NCPB. From the study findings, it was established that all the four costs of quality had a moderate to a high extent influence on performance of the NCPB where performance of the NCPB,  **$F(4,95)=32.393$ ,  $p<0.0005$ ,  $R^2=0.577$** . From the findings, it was established that prevention cost had a higher influence on performance of the NCPB with unstandardized coefficient of 13.0208. this indicates that if NCPB invests in prevention cost activities, its performance will be influenced favorably. The study findings established that despite NCPB understanding the four costs of quality, it has not implemented them fully due to logistical challenges mostly financial constraints. Schiffauerova & Thompson, 2006 cited that cost of quality approach has not been fully appreciated by organizations and NCPB's case shows this reality and this explains part of its dismal performance and the recent calls for disbandment.

#### **5.4 Contribution to the body of Knowledge**

Literature materials on costs of quality and performance of organizations are very scarce. While we have a lot of literature on the concepts of Total quality management, less has been done in connecting the various costs to attainment of the desired quality and consequent effective and efficient organizational performance. This study contributes to the few existing literature for purposes of future literature reviews. The study has also identified key areas that requires scholars to conduct studies on to close the existing knowledge gaps in the total quality management field of study.

#### **5.5. Recommendations for Policy and Practice**

Based on the findings of this study, the researcher made the following recommendations.

1. The researcher recommends that NCPB invests more in prevention cost activities since the study established that they have the highest influence on its performance. For a favorable influence, NCPB must be willing to invest on prevention cost activities to gain a competitive edge despite the monopoly it enjoys since this is being threatened by the fact that customers are willing to switch given a chance.
2. The researcher recommends the establishment of a cost of quality system in the National Cereals and Produce Board in Kenya to manage costs that results from non-recognized cost of qualities for convenient costs of operation for competitive advantage through ensuring zero defects.
3. There is need for NCPB to embrace systematic tracking of quality costs independently from the total overhead costs in order to increase the efficiency of recording business events and clearly communicate to the government the exact figures to allow for a more realistic and objective budgeting.

4. There is a great need of investing in appraisal and prevention costs of quality to reduce substandard produce and costs of poor quality namely external failure costs and internal failure costs.
5. NCPB should embrace modern packaging that indicates the manufacturing dates of their produce and the expire dates of the produce. This will increase customer's trust in the produce based on the dates

### **5.6 Suggested areas for further Research**

- i.) A similar study should be carried out on other state corporations like Kenya Railways, Kenya Airports that have been mandated with carrying out state projects.
- ii.) A study should be carried out on quality cost management and quantification of quality costs.
- iii.) A similar study should be carried out on national cereals and produce board in other Counties.

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**APPENDIX I. TRANSMITTAL LETTER**

SilaliNafulaColean,  
University of Nairobi  
P.O Box 30199-00100  
Nairobi

26/4/2019.

Dear Respondent,

**RE: PARTICIPATION IN RESEARCH**

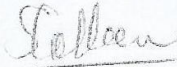
I am a student at the University of Nairobi pursuing a Master's degree in Project planning and management. I am conducting a study on how costs of quality influences project organizations performance at the National Cereals and Produce Board in Kapenguria, West Pokot County.

In order to carry out the study effectively, I am set to collect data and I therefore wish to kindly request your cooperation in providing objective and accurate answers on the questions I will be presenting to you. This study is purely for academic purposes and is not meant to evaluate or demean you in any way whatsoever. Please note that all the information collected as well as your identity will be treated with uttermost confidentiality.

Thank you.

Yours faithful,

SilaliNafulaColean.

  
Signature

## APPENDIX II. RESEARCH QUESTIONNAIRES FOR NCPB CUSTOMERS

Sheet No:

Thank you for taking your time to fill in this questionnaire. Your response to the questions herein will be treated confidentially. Please answer all the questions as best as you can.

A) Background Information.

i. Please indicate your location .....

ii. Gender                      Male                          Female   

What is your occupation?    Farmer        Trader        Others        kindly specify

iii. Which produce do you get/ supply NCPB?

a) Maize        b). Beans        c). Rice   

### **B). Internal Failure Costs and performance of the NCPB.**

i. In your own views, does disposing off contaminated produce influence performance of the NCPB?

Agree                          Disagree

ii. Briefly explain your choice of response

iv.        on a scale of 1 to 5 rate the extent to which the following internal failure costs activities influence performance of the NCPB where 1 is no influence, 2 small extent, 3 neutral, 4 moderate extent, 5 high extent.

Activity	1	2	3	4	5
i Grading cereals after purchasing					
ii Re dry the cereals to meet the moisture content specification					
iii Dispose off contaminated produce to prevent it from reaching customers					
iv Repackage the cereals in good bags after re drying and grading					
v Delays as a result of quality correction measures					

**B) External Failure costs and Performance of the NCPB**

i. Does customer satisfaction rating influence performance of the NCPB?

a) Yes  No

ii. Do you think customers' complaints influence performance of the NCPB?

a). Yes  b). No

Give a brief explanation for your choice of response

iii. From your experience with NCPB, are you likely to recommend your friend/ Relatives to purchase any produce from them?

Yes  No

Briefly give reasons for your choice of response above.



iv. Based on your experience with NCPB, how likely are you to move on to another organization to get your produce supply?

- Certain  High Chance   
 Low chances  Equal Chances

**C. Prevention costs and Performance of the National Cereals and Produce Board.**

i. Do you agree that produce inspection influences performance of the NCPB?

- Agree  Disagree

Briefly explain your choice of response above

ii. Please indicate the extent to which the following prevention costs activities influences performance of the NCPB where 1=no influence, 2 =small extent, 3= neutral, 4= moderate extent and 5= high extent.

Activity	1	2	3	4	5
1 Routine fumigation influences performance of the NCPB					
2 Training staff on quality issues influences Performance of NCPB					
3 Inspecting all produce influences performance of NCPB					
4 Routine aeration influences performance of the NCPB					

**D. Appraisal Costs and Performance of the NCPB**

i. Does vetting of suppliers on quality basis influences performance of the NCPB?

Agree

Disagree

ii. Based on your observations, do you think NCPB inspect all deliveries supplied before storing it?

Yes

No

Briefly explain your choice of response

iii. On a scale of 1 to 5 kindly indicate the extent to which the following appraisal costs of quality influences performance of the NCPB where 1=no influence, 2= small extent, 3=neutral, 4= moderate extent and 5= high extent

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Activity	1	2	3	4	5
1 frequent audits influences performance of NCPB					
2 Hiring enough produce inspectors influences performance of the NCPB.					
3 Vetting suppliers influences performance of the NCPB					
4 Purchasing inspection equipment and servicing them regularly influences performance of the NCPB					

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**E. Costs of quality and performance of the NCPB**

i. Does costs of quality influence performance of the NCPB?

Yes                       No

ii. Indicate on a scale of 1to 5 the extent to which the following costs of quality influences performance of the NCPB where 5 is high extent, 4 is moderate extent, 3 is neutral, 2 small extent and 1 no influence

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Cost of quality	1	2	3	4	5
1 Internal Failure costs					
2 External failure costs					
3 Prevention costs					
4 Appraisal costs					

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### **APPENDIX III: PRODUCE INSPECTOR'S INTERVIEW SCHEDULE.**

1. What is your position in this organization?
2. How long have you served in this position?
3. In your own views, how does appraisal costs of quality influence the performance of the NCPB in Kapenguria, West Pokot County?
4. What are your views on the influence of internal failure costs on the performance of NCPB in Kapenguria, West Pokot County?
5. How do you compare the influence of external failure costs to prevention costs on the performance of NCPB in Kapenguria, West Pokot County?
6. In your own views, which costs of quality most influence the performance of NCPB at Kapenguria West Pokot County?