IMPACT OF ISO 9001:2000 CERTIFICATION ON THE PERFORMANCE OF TEA PROCESSING FACTORIES IN KENYA:
A CASE OF KAGWE TEA FACTORY COMPANY LIMITED

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Reg No. D53/OL/15809/05

A research project towards partial fulfillment of the requirements for the award of degree of master of business administration of Kenyatta University
DECLARATION

This work is my original research information and has never been presented in any other university.

Signature........................................Date.................................

Njue Elijah Njagi

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

Signature........................................Date.................................

Chrispen Maende

Signature........................................Date.................................

Shadrack Bett

Chairman Business Administration
Every organization would like to improve the way it operates, whether that means increasing market share, driving down costs managing risks more effectively or improving customer satisfaction. A quality management system gives organizations a framework that is needed to monitor and improve performance in an area of choice. This study therefore investigated how ISO 9001:2000 certification impacts on the performance of Kagwe tea factory company limited. This study is significant in that the findings may help the management of Kagwe tea factory know how ISO 9001:2000 certification has impacted on her performance on top of adding into the body of knowledge on how tea manufacturing factories benefits from attaining quality management systems certification. The necessary information was attained through questionnaires and interviews. The data collected was analyzed through bar graphs, tables, line graphs percentages and pie-charts. This research is expected to create awareness to the various stakeholders in the tea processing factories on how quality management system (ISO 9001:2000) impacts on the performance of tea processing factories and help in the decision making process.
ACKNOWLEDGEMENT

I would wish to acknowledge my project supervisor Mr. Chrispen Maende for the academic guidance, advice and support which has made this study successful. I further acknowledge the management and staff of Kagwe Tea Factory for allowing me to undertake the case study in their company.
DEDICATION

This study is dedicated to my parents Njue and Elizabeth, my wife Judy, my two lovely daughters Lilian and Michelle, and all my brothers and sisters.
TABLE OF CONTENTS

Title page.................................................................................. i
Approval details................................................................. ii
Abstract..................................................................................... iii
Acknowledgements..................................................................... iv
Dedication................................................................................. v
Table of content.......................................................................... vi
List of tables................................................................................. vii
List of Figures................................................................................. viii
Definition of operational terms....................................................... ix
Abbreviations and acronyms......................................................... xi

CHAPTER ONE

1.0 Introduction........................................................................... 1
1.1 Background of the problem..................................................... 1
1.1.2 Quality management systems.............................................. 2
1.1.3 International organization for standardization (ISO).............. 6
1.1.4 Kagwe tea factory co. ltd...................................................... 7
1.2 Statement of the problem....................................................... 7
1.3 General objective of the study............................................... 9
1.4 Specific research objectives................................................... 9
1.5 Research questions............................................................... 10
1.6 Purpose of the study............................................................. 10
1.7 Scope of the study.................................................................. 11
1.8 limitation of the study.......................................................... 12

CHAPTER TWO

2.0 Introduction........................................................................... 13
2.1 Literature review.................................................................... 13
2.2 Kagwe tea factory quality management system interaction........ 16
### 2.3 Definition of variables

### 2.4 Conceptual framework

#### CHAPTER THREE

3.0 Introduction ................................................. 18
3.1 Research design ........................................... 18
3.2 Target Population ......................................... 18
3.3 Sampling Technique ....................................... 18
3.4 Data collection ............................................ 19
3.5 Data analysis .............................................. 19

#### CHAPTER FOUR

4.0 Data Analysis and Interpretation ........................... 21
4.1 Introduction .................................................. 21
4.2 Impact of ISO 9001:2000 Certification on the costs of Kagwe Tea Factory Co.ltd........ 21
4.3 Impact of ISO 9001:2000 Certification on the Through-put of Kagwe Tea Factory Co.ltd... 24
4.6 Impact of ISO 9001:2000 Certification on the conversion factor/out-turn of Kagwe Tea Factory Co.ltd.......................... 30
4.7 Impact of ISO 9001:2000 Certification on the Shareholders’ income of Kagwe Tea Factory Company Limited........................................ 33

#### CHAPTER FIVE

5.0 Research Findings, Recommendations and Conclusions ...................................... 36
5.1 Introduction .................................................. 36
5.2 Research findings ........................................... 36
5.3 Recommendations and conclusions. ........................................... 37
References .................................................................. 39
Appendix 3: Letter of introduction .................................... 40
Appendix 4: Questionaire ........................................... 41
Appendix 6: Interview schedule .................................... 46
**LIST OF TABLES**

**Table 4.1:** Kagwe Tea Factory Company limited Production costs four years before and four year after ISO 9001:2000 certification

**Table 4.2:** Kagwe Tea Factory Company limited through-put four years before and four year after ISO 9001:2000 certification

**Table 4.3:** Kagwe Tea Factory Company limited Top-grade percentage four years before and four year after ISO 9001:2000 certification

**Table 4.4:** Kagwe Tea factory company limited percentage out-turn four years before and four year after ISO 9001:2000 certification

**Table 4.5:** Kagwe Tea Factory Company limited shareholder’s income four years before and four year after ISO 9001:2000 certification
LIST OF FIGURES

Fig 2.1: Conceptual framework

Fig 4.1: A line graph showing cost trend before and after certification

Fig 4.2: A pie-chart showing average cost before and after certification

Fig 4.3: A line graph showing through-put trend before and after ISO 9001:2000 certification.

Fig 4.4: A pie chart showing the average through-put before and after ISO 9001:2000 certification.

Fig 4.5: A line graph showing the trend of top-grade percentage before and after ISO 9001:2000 certification.

Fig 4.6: A pie-chart showing the average top-grade percentage before and after ISO 9001 certification.

Fig 4.7: A line graph showing the trend of percentage out-turn/ conversion factor before and after ISO 9001:2000 certification.

Fig 4.8: A pie-chart graph showing the average out-turn before and after ISO 9001 certification.

Fig 4.9: A line graph showing the trend of shareholders income before and after ISO 9001 certification.

Fig 4.10: A pie-chart graph showing the average shareholders income before and after ISO 9001 certification.
DEFINITION OF OPERATIONAL TERMS

Quality:- This term as used in this research refers to the extent to which made tea meets the buyers expectation.

Performance:- This term as used in this research refers to the organization's ability to attain its goals by using resources in an efficient and effective manner.

Shareholders: This term as used in this research refers to all the small-scale tea farmers who deliver their green tea leaves to Kagwe tea factory.

Managing Agent: A company rendering management and is given some agreed management fee.

Out-turn : This term as used in this research refers to the ratio of made tea to green leaf expressed as a percentage.

Conversion factor: This term as used in this research has the same meaning as out-turn.

Top grade : The total weight of primary grades expressed as a percentage of the total made tea.

Through-put : This term as used in this research refers to the amount of green leaf processed per hour.

Catchment: The area under tea growing serving Kagwe Tea Factory

Production cost: The amount of money in Kenya shillings spent on manufacturing one kilogram of made tea

Certification: ISO9001:2000 certification
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>QC</td>
<td>Quality control</td>
</tr>
<tr>
<td>ADMIN&amp;HR</td>
<td>Administration &amp; human resources</td>
</tr>
<tr>
<td>ICT</td>
<td>Information communication technology</td>
</tr>
<tr>
<td>ACCTS &amp; STRS</td>
<td>Accounts and stores</td>
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<tr>
<td>QMS</td>
<td>Quality management system</td>
</tr>
<tr>
<td>FUM</td>
<td>Factory Unit manager</td>
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<tr>
<td>PM</td>
<td>Production manager</td>
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<td>PA</td>
<td>Production assistant</td>
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<tr>
<td>FSC</td>
<td>Field services coordinator</td>
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<tr>
<td>TESA</td>
<td>Technical services assistant</td>
</tr>
<tr>
<td>JIT</td>
<td>Just in time</td>
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<td>TQM</td>
<td>Total quality management</td>
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<td>KTDA</td>
<td>Kenya tea development agency limited</td>
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<tr>
<td>Co. ltd</td>
<td>company limited</td>
</tr>
<tr>
<td>MT/hr</td>
<td>Made tea per hour</td>
</tr>
<tr>
<td>GL/Hr</td>
<td>Green leaf per hour</td>
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<tr>
<td>Kgs/Bush</td>
<td>Kilograms per bush</td>
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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Kenya is a major tea-producer. It has more than 110,000 hectares of land devoted to tea. In Kenya, tea is grown in the highland areas with adequate rainfall and low temperatures. The main tea-growing area is in the Kenyan Highlands, west of the Rift Valley, at altitudes between 5,000 and 9,000 feet. Tea is a major foreign exchange earner, and the main source for 17 to 20 percent of Kenya's total export revenue. In 1995, the tea industry brought US$342 million into the country and Kenya became the largest exporter of black tea in African and third largest in the world. Small-scale farmers grow more than 80 per cent of it while the rest is by large-scale producers. Small-scale farmers market their produce through the umbrella of KTDA, who is in charge of collection, processing and selling of processed leaves. Large-scale producers of Kenyan tea include Brooke Bond, George Williamson, Eastern Produce and African Highlands. Unlike small-scale farmers, large-scale growers are responsible for processing and marketing of their own crop. Kenya's production is usually in the region of 245 million kilos per year. The majority of the Kenyan tea production is sold through the Mombassa auction, with Pakistan, the UK and Egypt being the biggest buyers. Kenya Tea Development Authority and Association of Tea Growers develop and market Kenyan teas worldwide. These organizations' aims are to promote recognized standards and certification for the industry in general. They have made outstanding contributions to the Kenyan economy through excellence, innovation and quality in exporting overseas. They also provide a market for the 314,875 farmers who depend on tea growing as a livelihood. Established under an act
of parliament (cap.343) in June 1950, the Tea Board of Kenya licenses tea growers manufacturing and exports. The board also carries out research on tea through the technical arm; The Tea Research Foundation of Kenya is composed of the government, Kenya Tea Development Authority, Kenya Tea Growers Association, Nyayo Tea Zone, Development Corporation and East Africa Tea Trade Association. Kenya production is almost exclusively CTC manufacture (cut, twist and curl). This type of manufacture produces strong-liquoring teas, which yield a high number of cups per kilo, when brewed both loose and in teabags. The bushes are harvested throughout the year, with the best quality being produced in January and February and again in July, during the drier periods of the year. (http://www.teaauction.com/industry/kenyatea.asp)

1.1.2 Quality management systems

Quality has been defined in very many ways and there is therefore no standard definition. (WinsorJ.D, 2008) argues that “Each company will most likely define quality differently based on its customers base, product line, mission statement and competitive strategy. A good place to start is to identify products or service features that will meet the customer’s most important needs and wants.”

According to Vonderembse,M.A(2004), “quality is the degree to which a specific product conforms to a design or specification”. He goes further to say that “quality is consistently meeting or exceeding the customer’s needs and expectations”. According to Basu, R (2004), “Quality of a product or service is the degree to which it satisfies customers requirements”. On the other hand management has been defined by Baft,L 2000, as
"management is the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading and controlling organization's resources".

Quality management is a method for ensuring that all the activities necessary to design, develop and implement a product or service are effective and efficient with respect to the system and its performance. Quality management can be considered to have three main components: quality control, quality assurance and quality improvement. Quality management is focused not only on product quality, but also the means to achieve it. Quality management therefore uses quality assurance and control of processes as well as products to achieve more consistent quality.

Quality management is not a recent phenomenon. Advanced civilizations that supported the arts and crafts allowed clients to choose goods meeting higher quality standards than normal goods. In societies where art and craft (and craftsmanship) were valued, one of the responsibilities of a master craftsman (and similarly for artists) was to lead their studio, train and supervise the work of their craftsmen and apprentices. The master craftsman set standards, reviewed the work of others and ordered rework and revision as necessary. One of the limitations of the craft approach was that relatively few goods could be produced; on the other hand an advantage was that each item produced could be individually shaped to suit the client. This craft based approach to quality and the practices used were major inputs when quality management was created as a management science. Customers recognize that quality is an important attribute in products and services. According to Vonderembse, M.A (2004) "quality is often the first factor customers consider when making a purchase decision". In fact some people have even
suggested that companies can no longer use quality to differentiate their products from those of competitor because all companies emphasize quality.

Suppliers recognize that quality can be an important differentiator between their own offerings and those of competitors (quality differentiation is also called the quality gap).

In the past two decades this quality gap has been greatly reduced between competitive products and services. This is partly due to the contracting (also called outsourcing) of manufacture to countries like India and China, as well internationalization of trade and competition. These countries amongst many others have raised their own standards of quality in order to meet International standards and customer demands. The ISO 9000 series of standards are probably the best known International standards for quality management.

Every organization would like to improve the way it operates, whether that means increasing market share, driving down costs, managing risk more effectively or improving customer satisfaction. A quality management system gives you the framework you need to monitor and improve performance in any area you choose. ISO 9001 is by far the world’s most established quality framework, currently being used by around 897,000 organizations in 170 countries worldwide, and sets the standard not only for quality management systems, but management systems in general. Most organizations seek this certification in the hope of improving the quality of their products or services so as to satisfy their customers.
ISO 9001 is one of a series of quality management system standards. It can help bring out the best in an organization by enabling it to understand its processes for delivering its products/services to its customers. This series of standards consist of:

ISO 9000 – Fundamentals and Vocabulary: this introduces the user to the concepts behind the management systems and specifies the terminology used.

ISO 9001 – Requirements: this sets out the criteria you will need to meet if you wish to operate in accordance with the standard and gain certification.

ISO 9004 – Guidelines for performance improvement: based upon the eight quality management principles, these are designed to be used by senior management as a framework to guide their organizations towards improved performance by considering the needs of all interested parties, not just customers. ISO 9001 standard contains the actual requirements an organization must be in compliance with to become ISO 9001 Registered.

ISO 9001:2008 is the current version of the Standard. It was called ISO 9001:2000 until it was revised in the year 2008. Past versions of ISO 9000 included ISO 9002 and ISO 9003, but those are no longer in use. Companies are now only registered to ISO 9001. The requirements of this standard are generic and are intended to be applicable to all organizations, regardless of type, size and product/service provided. The standard has eight clauses namely: Scope, Normative reference, Terms and definitions, Quality management system, Management responsibility, Resource management, Product realization, Measurement, analysis and improvement. Any organization wishing to be certified for this standard must proof compliance to the above clauses.
1.1.3 International organization for standardization (ISO)

International organization for standardization (ISO) is the world largest standards developing organization. Between 1947 and the present day, ISO has published more than 17000 International Standards, ranging from standards for activities such as agriculture and construction, through mechanical engineering, to medical devices, to the newest information technology developments.

According to International organization for standardization annual report (1975), the need for harmonization of the standardization process on the international level led to the creation of ISO in 1947. Given the multi-sector scope of the organization, it would be hard to present a historical perspective summarizing the challenges, the passion, the outstanding achievements or, sometimes, the missed opportunities, in the large variety of sectors covered by ISO's technical work. ISO was born from the union of two organizations - the ISA (International Federation of the National Standardizing Associations), established in New York in 1926, and the UNSCC (United Nations Standards Coordinating Committee), established in 1944.

In October 1946, delegates from 25 countries, meeting at the Institute of Civil Engineers in London, decided to create a new international organization, of which the object would be "to facilitate the international coordination and unification of industrial standards". The new organization, ISO, officially began operations on 23 February 1947. (International Organization for standardization; annual review report (1975).
1.1.4 Kagwe tea factory co. ltd

Kagwe tea factory limited was built from 1981 to 1983. Commissioning was done in 1984 for the commercial black tea manufacture. The factory is located in Gatamaiyu division of Kiambu west district, in central province. It is situated 60kms from Nairobi along Kagwe-kimende route along aberdare ranges.

The factory serves five (5) administrative locations of gatamaiyu division serving 6097 small scale tea growers. The area under tea cultivation measures up to 1954.5 hectares with a total of 16.6M bushes, all distributed in 61 tea buying centers. This factory has a processing capacity of 15Million kilogrammes of green tea leaves per year but currently exceeds this capacity by around 3 Million kilogrammes. Kagwe tea factory was certified for ISO 9001-Quality management system in 2005 and has maintained the standard up to now. The factory has 157 employees and seven members of management.

1.2 Statement of the problem

The business environment is very dynamic and competitive. In order to survive, organizations are applying various business strategies to ensure that they remain relevant and competitive. In recent years, the impact of global competition, shorter product life cycles and the need to satisfy customers has led to new management approaches, more sophisticated manufacturing systems and investment in technology. Before 1970s, there was little overseas competition, costs were passed on to customers, minimal efforts were made to maximize efficiency/reduce costs/improve management practices. In 1980s, many were government-owned monopolies or protected by highly regulated, non-competitive environments. Cost increases were covered by increasing prices. Cost
systems were not deemed necessary. Organizations could rely on years of high demand for products.

Now, there is massive overseas competition, and global networks for acquiring raw materials and distributing high quality, low-priced goods. Privatization and deregulation has resulted in intense competition, an increasing product range and a need for sophisticated costing systems. Competitive environment, technological innovation and discriminating and sophisticated customer demand require continual product redesign and quick time to market. These changes in global business have led most organizations either in product or service provision to formulate and adopt new business strategies in order to remain competitive and satisfy ever changing customers’ requirements.

Some of these strategies include Just in Time Systems (JIT), Total Quality Management system (TQM), and Quality Management Systems (QMS). ISO9001 (Quality Management Systems) has become very common with both manufacturing and service industry despite the enormous resources that it requires to implement since most customers are being drawn towards organizations with international standards. Quality management system Requires a lot of time to write associated manuals, has high cost of implementation since most firms engage consultancy services. There is also high cost of maintaining the standard since for a firm to retain the certification it has to pass frequent surveillance audits that are carried out by the certification bodies.

Tea processing Factories in Kenya are blindly investing heavily in getting ISO9001:20000 certification without carrying out an assessment on how the certification...
will enhance/improve the performance. Consideration of this situation leads logically to
the question of whether ISO 9001:2000 certification enhances performance of tea
processing factories. One of the difficulties in answering this question is the general lack
of knowledge on how implementation of ISO 9001 impacts on the performance of tea
processing factories in-terms of quality, efficiency, cost controls, staff motivation, sales,
profits and general customer satisfaction. Therefore this study will seek examine the
impact of ISO 9001 implementation on the performance of Kagwe tea factory company
limited in terms of costs, conversion factor, throughput, top -grade and shareholders’
income.

1.3 General objective of the study.

The general objective of this study is to find out how ISO 9001:2000 certification
impacts on the overall performance of tea processing factories in Kenya.

1.4 Specific research objectives

In order to answer the above research questions the following objectives have been set:-

1. To find out the impact of ISO 9001:2000 certification on the production cost of
Kagwe Tea Factory Co. Ltd

2. To find out the impact of ISO 9001:2000 On the conversion factor/ out-turn of
Kagwe Tea Factory Co. Ltd

3. To find out the impact of ISO 900:2000 certification on the shareholders’ income
of Kagwe Tea Factory Co. Ltd
4. To find out the impact of ISO 9001:2000 on the top-grade percentage of Kagwe Tea Factory Co. Ltd

5. To find out the impact of ISO 900:2000 certification on the through-put of Kagwe Tea Factory Co. Ltd.

1.5 Research questions

This research sought to answer the following questions:

1. What is the impact of ISO 9001:2000 certification on the production cost of Kagwe Tea Co. Ltd


3. How has ISO 9001:2000 impacted on the shareholders’ income of Kagwe Tea factory Co. Ltd

4. How has ISO 9001:2000 impacted on the top-grade of Kagwe Tea factory Co. Ltd

5. What is the impact of ISO 9001:2000 certification on through-put of Kagwe Tea Factory Co. Ltd.

1.6 Purpose of the study

The findings of this study may help the management of Kagwe tea Factory Company limited know whether they have been any significant gains after ISO 9001:2000 certification and thus enhance the performance of quality management system. The findings will also help the management and the board of directors of Kagwe tea factory in justifying the enormous resources spent on the ISO 9001 certification and maintenance of this system.
The findings of this study may also help the management of Kagwe tea factory and the shareholders to know whether it is necessary to maintain the standard and remain certified and whether ISO 9001:2000 was a worthy investment.

The findings may help the senior management and board of directors of Kenya Tea Development Agency Limited (KTDA) as a managing agent in making future decisions on ISO 9001:2001 certification in her managed tea processing factories across the country and all others that will come up in future.

The study findings may contribute to the body of knowledge on how ISO 9001:2000 impacts on performance of tea processing factories in Kenya and this will help stakeholders in the tea manufacturing industry in decision making process on committing resources to get ISO 9001:2000 certification.

1.7 Scope of the study

This study limited itself to the 7 members of management and 87 employees of Kagwe tea factory company limited in finding out whether ISO 9001:2000 certification has had any impact on the performance of the factory in the areas of production costs, conversion factor, through-put, top-grade and shareholders’ income.

1.8 Limitations of the study

In carrying out this study, adequate time was the greatest challenge bearing in mind the amount of data that was to be collected and analyzed however the researcher sought leave of absence to get all the information required to make this study a success.
CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction.

This chapter outlines the various studies that have been carried out on quality management system (ISO9001:2000) and what the findings or recommendations were. The chapter further outlines the conceptual framework on how quality management system fits into the processes of a tea manufacturing factory.

2.1. Literature review

A number of studies have been carried out focusing on the quality management systems and how implementation of this system affects businesses and other organizations.

Several awards have been formulated to recognize those organizations that are keen in enhancing quality of either product or service at all times.

Vonderembse, (2004) In his book on the core concepts of operations management, he found out that to promote the adoption of quality concepts and techniques by companies and to recognize those companies that have excelled, several awards have been developed. Some of these awards includes the Japan’s Deming prize, named after W Edward Deming. It is awarded annually to companies that achieve a certain level of quality. The other award is the Malcolm Baldrige National quality award (MBNQA) awarded to organizations for promoting awareness of quality and increasingly important element in competitiveness. In spite of the Baldrige award and Deming prize, there is no
generally accepted standard that can be used to determine whether or not a company provides high quality. However, international organization for standardization (ISO) which is made up of standards organizations representing many countries has taken a first step in that direction through its ISO 9001 standard.” (Vonderembse, (2004))

ISO 9001 certification means that an organization constantly meets rigorous standards, which are well documented, of management quality of products and services. To retain certification the organization is audited annually by an independent body. ISO 9001 certification to an organization demonstrates to its customers and all other interested bodies that it has an effective quality assurance system in place. Basu goes further to define quality assurance as the activities needed to provide adequate confidence that an entity will fulfill requirements for quality. He moves further to articulate that ISO 9001 gives the customers confidence that the product or service being provided will meet certain specified standards of performance and that the product or service will always be consistent with those standards. In deed some customers will insist that their suppliers be ISO 9001 certified (Basu (2004)

By adopting ISO 9001, the methodology of the ISO system will show an organization how to go about establishing and documenting a quality improvement system. According to Basu R, “to achieve accreditation, an organization has to prove that every step of the process is documented and that the specifications and check procedures shown in the documentation are always complied with”. This means that consistency is always
achieved and this boosts customer’s confidence. This process of recording and documenting of each and every step is a long, tedious and expensive exercise.

Organizations define quality in their own way different from each other even if offering the same products or services. This means that quality means different things to different people. According to Winser (2008), “Each company will most likely define quality differently based on its customer’s base, product line, mission statements and competitive strategy”. This means therefore that ISO 9001 may not necessary dictate what organizations may define as quality but will require a system to ensure that whatever the definition, systems are put in place to enhance it.

Some of the reasons that led to the developments of quality standards include the development of multinational companies which found their commercial activities hampered by conflicting national standards and the growing interest of governments in an international technical platform for the development of harmonized regulations. ISO 9001 was developed along this line to enhance international uniformity in ensuring quality management system in every organization follows some basic rules and guidelines. (International Organization for standardization annual review report for 1975).

When a standard is established, it means that the same thing will be done in the same way all the times. This may result in lack of creativeness in an organization. Basu R argues that adoption of ISO 9001 results in a standard method of doing things and this will likely
be set by the management and once set in place the bureaucracy which may lead to lack of creative improvements. He therefore continues to argue that “if the customer is not insisting on ISO accreditation, then the time and effort will be non recoverable cost and makes the value of ISO to an organization questionable”. Therefore organizations require adequate information and if need be carry out a cost benefit analysis before embarking on the ISO certification exercise. (International Organization for standardization annual review report for 1975)

2.2 Kagwe tea factory quality management system interaction

Quality management system (ISO 9001:2000) interacts with all the processes in kagwe tea factory. The performance therefore of each of the process aims at fulfilling the requirements of this international standard to enhance performance.

2.3 Definition of variables

Quality management system interacts with all the factory processes in Kagwe tea factory to enhance efficiency of all the processes which includes field services, tea processing, packing, dispatch, procurement and other support services like accounts, human resource, information communication technology and administration. This interaction enhances efficiency and thus improves the general performance of the factory in terms of reduced production cost, improved shareholders income, increased top-grade, and higher through-put and improved conversion factor. ISO 9001:2000 certification is the independent variable while factory performance which is measured by production cost, top-grade percentage, out-turn / conversion factor, shareholders income and through-put
is the dependant variable. Performance is basically the factory's ability to attain its goals through utilization of its resources in an effective manner. Production cost is the amount of money in Kenya shillings spent to produce one kilogram of made per financial year. Throughput on the other side is the average amount of green leaf processed per hour in a given financial year while conversion factor is the ratio of made tea to green leaf expressed as a percentage. Top-grade percentage is the total weight of the primary grades expressed as a percentage of the total made tea. Shareholders income refers to the total amount of money paid to the shareholders per every kilogram of green leaf they deliver to the factory in a financial year. The independent and dependent variables relates as shown in the diagram below:

2.4 Conceptual framework

ISO 9001:2000 sets out the methods that can be implemented in an organization to ensure customers' requirements are fully met. Not only does a fully documented quality management system ensure the customers' requirements are met, but the organization's requirements will be met both internally and externally and at optimum cost. This is the result of efficient utilization of the available resources, materials human and technological (Oakland (1989).

According to Owen 1986, there are numerous reasons why many companies are now developing their quality systems to the requirements of ISO 9001:2000. They include reduced cost of customer's claims, reduce first time failure, get things right the first time, improve services to customers and increase competitiveness
Fig 2.1: Conceptual framework

**Performance (dependent variable)**

- Production Cost
- Conversion factor
- Top-grade percentage
- Through-put
- Shareholders' income

**ISO 9001:2000 (Independent variable)**

Source: Researcher
CHAPTER THREE
RESEARCH METHODOLOGY

3.0. Introduction

This chapter outlines the methodology that was used in the study. It deals with the proposed research design, target population size, sampling technique, data collection procedures, data analysis and the expected output.

3.1. Research design

Since there are many tea processing factories in Kenya and are similar in terms of operations, the researcher carried out a case study for one factory and the findings can well apply to all others.

3.2 Target Population

The target population was all the 94 permanent employees of Kagwe Tea Factory Company Limited who comprise of 7 and 87 management and general staff respectively.

3.3 Sampling Technique

Simple random sampling technique was used for this study. This was preferred because the sample in this technique is selected in such a way that every item in the population has an equal chance of being included. Again it is only type of sample one is confident of being free from bias. The entire staff of Kagwe Tea Factory Company limited comprises 94 employees. In order to get a representative sample from the employees, the payroll numbers of each employee was written on a piece of paper and folded, put in a basket and thoroughly mixed. Then twenty five (35) folded papers were drawn from the basket.
blindly one at a time without replacement. The thirty five employees who are actually 37.23% (35/94 x 100) of the total staff formed a representative sample and the questionnaire was administered to them.

3.4 Data collection

Data was collected from both primary and secondary sources. Secondary data was collected from the factory records and other related factory documents. Data was collected through questionnaires served to respondents through personal drop and pick method. Another technique that was used is interviews. This method was appropriate and effective since follow-up questions were asked for clarification hence obtaining all the relevant information. The information collected through interview was on the general knowledge and understanding of the ISO 9001:2000.

3.5 Data analysis

For data analysis and presentation, various techniques were used. One of the techniques used was tables. Tables are able to present data clear and easy to understand since data presented in tables is systematic and organized. The data that was analyzed through this technique was field data which included the total production costs, out-turns, factory throughputs, process efficiencies and shareholders income. This showed clearly how ISO 9001 has impacted on the general performance on costs and processes efficiency especially the top grades and conversion factor or out-turn. This further enhanced proper judgment made as pertaining to the extent to which ISO 9001:2000 has impacted on the performance of Kagwe Tea Factory Co. Ltd.
Line graphs were used to present data that will be collected in the field in a more clear way that shows the trends and variations of performance before and after certification. Through line graphs it was very easy to understand and interpret the trends in terms of cost, income and process efficiency over a period of time before Kagwe was certified and after certification. This greatly helped in indicating the general trend of costs and processes efficiency after the factory got the certification.

Another technique used to analyze data was percentages. This was used to show comparisons between the various aspects of performance like cost, shareholders income and processes parameters like out turn, through-put, top grades before and after ISO 9001:2000 certification. It was also used to analyze and compare the average performance of the various key performance indicators before and after certification.

The research tool was thoroughly assessed and scrutinized by the research supervisor and four fellow MBA students in relation to the topic and objectives of the study and it was found valid. On reliability, piloting was done by collecting data from similar samples in two ISO 9001:2000 certified factories using the research tool. The collected data was analyzed and correlated to establish reliability of the research tool before the actual study. Reliability of the pilot samples was 0.82. This provides the needed confidence that the research tool could gather reliable data in the research study.
4.0 Introduction

This chapter deals with the analysis, presentation and interpretation of data collected from the field.


Table 4.1: Kagwe Tea Factory Company limited Production costs four years before and four year after ISO 9001:2000 certification

<table>
<thead>
<tr>
<th>Before certification</th>
<th>After certification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial year</td>
<td>Cost(kshs/kgMT)</td>
</tr>
<tr>
<td>2001/2002</td>
<td>50.00</td>
</tr>
<tr>
<td>2004/2005</td>
<td>54.22</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>52.79</strong></td>
</tr>
</tbody>
</table>

Source: Field survey
From the above line graph it is evident that the total cost for kagwe Tea Factory Company limited increased with ISO 9001: 2000 certification. This means the objective of reducing cost by implementing this certification was not achieved. Maintenance of ISO standard is expensive since the factory is required to pass all the consecutive surveillance audits in order to sustain the certification status.
From the above graph, it is very clear that on average, the cost before certification was Kshs.52.79 per kilogram of made tea and Kshs.64.99 after certification. Therefore ISO 9001:2000 impacted negatively on the cost of this company, by increasing it by 12% on average.
1.2 Impact of ISO 9001:2000 certification on the through-put of Kagwe tea factory

Table 4.2: Kagwe Tea Factory Company limited through-put four years before and four year after ISO 9001:2000 certification

<table>
<thead>
<tr>
<th>Financial year</th>
<th>Throughput (kgs/hr)</th>
<th>Financial year</th>
<th>Throughput (kgs/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average</strong></td>
<td><strong>4708</strong></td>
<td></td>
<td><strong>3697</strong></td>
</tr>
</tbody>
</table>

Source: Field survey
Fig 4.3: A line graph showing through-put trend before and after ISO 9001:2000 certification.

From the above line graph, it is evident that the through-put of Kagwe Tea Factory Co. Ltd dropped with the implementation of ISO 9001:2000. The factory through-put being one of the key performance indicator of the factory performance deteriorated with certification implying a negative impact.
From the above pie-chart graph it is evident that the average the through-put was 4708kgs/hr before certification and it dropped to 3697kgs/hr after certification. This represents a 21.47% drop. Therefore ISO 9001:2000 has impacted negatively on the through-put of Kagwe tea Factory Company limited by decreasing it by 21.47% on average.
### Impact of ISO 9001:2000 certification on the top-grade percentage of Kagwe tea factory company limited

Table 4.3: Kagwe Tea Factory Company limited Top-grade percentage four years before and four year after ISO 9001:2000 certification

<table>
<thead>
<tr>
<th>Financial year</th>
<th>% Top grade</th>
<th>Financial year</th>
<th>% Top grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001/2002</td>
<td>97.05</td>
<td>2005/2006</td>
<td>98.46</td>
</tr>
<tr>
<td>2004/2005</td>
<td>98.21</td>
<td>2008/2009</td>
<td>98.72</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>97.87</strong></td>
<td></td>
<td><strong>98.58</strong></td>
</tr>
</tbody>
</table>

Source: Field survey
Fig 4.5: A line graph showing the trend of top-grade percentage before and after ISO 9001:2000 certification.

From the above graph it is evident that the Top-grade percentage for kagwe tea Factory Company limited improved with ISO 9001: 2000 certification. This being a major key performance indicator as it indicated the percentage of the primary grades which fetch better prices in the international tea market, then ISO 900 certification enhanced it hence better company performance.
Fig 4.6: A pie-chart showing the average top-grade percentage before and after ISO 9001 Certification.

On average the Top-grade percentage improved from 97.87% to 98.58 % after the factory was certified for ISO 9001:2000. This represents an average improvement of 0.73 % .Therefore ISO 9001:2000 has impacted positively on the top-grade percentage of Kagwe tea Factory Company limited.
4.5 Impact of ISO 9001:2000 certification on the conversion factory / out-turn percentage of Kagwe tea factory company limited

Table 4.5: Kagwe Tea factory company limited percentage out-turn four years before and four year after ISO 9001:2000 certification

<table>
<thead>
<tr>
<th>Financial year</th>
<th>% Out-turn</th>
<th>Financial year</th>
<th>% Out-turn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average</strong></td>
<td><strong>26.21</strong></td>
<td></td>
<td><strong>25.47</strong></td>
</tr>
</tbody>
</table>

Source: Field survey
From the above graphs it is evident that the out-turn percentage or conversion factor for Kagwe tea factory company deteriorated with ISO 9001: 2000 certification. The deteriorated conversion factor implies less made tea from the same volumes of raw material hence less income and poor performance. Therefore the certification impacted negatively on this key performance indicator.
From the above graph it is evident that the conversion factor before certification was 26.21% and 25.47% after ISO 9001:2000 certification. This represents on average a drop of 0.74% which is quite significant bearing in mind the volume of green leaf processed per year. ISO 9001:2000 has therefore impacted negatively on the conversion factor of Kagwe tea Factory Company limited.
4.6 Impact of ISO 9001:2000 certification on the shareholder’s income of Kagwe tea Factory Company limited

**Table 6:** Kagwe Tea Factory Company limited shareholder’s income four years before and four year after ISO 9001:2000 certification

<table>
<thead>
<tr>
<th>Financial year</th>
<th>Shareholders income (kshs/kg GL/Year)</th>
<th>Financial year</th>
<th>Shareholders income (kshs/kg GL/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average</strong></td>
<td><strong>22.96</strong></td>
<td></td>
<td><strong>27.91</strong></td>
</tr>
</tbody>
</table>

Source: Field survey

From the above graphs it is quite evident that the shareholder’s income has significantly increased in Kagwe tea Factory Company limited. This increase is attributed to the implementation of the ISO 9001:2000 certification. Having been one of the objectives of the company, this has not only increased the income but also improved the quality of the tea produced and hence better position in the market.
Fig 4.9: A line graph showing the trend of shareholders income before and after ISO 9001 certification.

From the above graphs it is clearly evident that on average, the shareholder’s income for Kagwe tea Factory Company limited improved tremendously with ISO 9001: 2000. This having been one of the objective and key performance indicator, the certification enhanced it and hence better factory performance.
It is very clear from the above chart that on average, shareholder’s income before certification was Kshs.22.96 per kilogram of Green leaf and Kshs.27.91 per kilogram of green leaf after certification. This represents an increase of 21.56%. ISO 9001:2000 has therefore impacted positively on the Shareholder’s income.
CHAPTER FIVE

RESEARCH FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.0 Introduction

This chapter discusses the research findings, recommendations and conclusions. It outlines the outcome of the study in relation to the research questions.

5.1 Research findings.

The study has found out that Kagwe tea Factory Company limited is public company and was commissioned in 1984. It has no other business other than tea manufacture and has 6000 shareholders who deliver their Green tea leaves to the factory. The factory was certified for ISO 9001:2000 in 2005 with the objective of improving efficiency, reducing production costs and enhances customer satisfaction.

The study has also found out that Kagwe Tea factory company limited costs increased with ISO 9001:2000 certification. The costs before certification were lower than after certification. This could be due to the costs needed to maintain the requirement of this standard. This denotes a negative impact as the certification was aimed at reducing costs.

The study also found out that the Kagwe tea factory top-grade percentage increased with ISO 9001 certification. This improvement in this key performance indicator implies more revenue as top-grades fetch better prices in the international tea market. The increase therefore indicates better performance and this implies that ISO 9001 certification impacted positively on manufacture of more primary grades hence improved income.
The study has also found out that the through-put of the company which is the amount of green leaf processed per hour decrease with ISO 9001:2000 certification. This means reduction in processing efficiency and this would mean more running hours hence high electricity cost, labour cost and fuel cost. This reduction in the factory through put could have also contributed to the increase in overall costs. This means that the certification impacted negatively on this crucial indicator of performance, in other word it deteriorated performance in terms of through-put.

The study also found out that on average the conversion factor/out-turn of Kagwe tea factory decreased with ISO 9001:2000 certification. This means that less made tea was being made from the same amount of green leaf after certification. This indicates a negative impact on this critical key performance indicator. Therefore the certification deteriorated the performance of Kagwe tea factory in-terms of out-turn, hence a negative impact on performance.

On the Shareholder’s income, the study found out that ISO 9001:2000 certification greatly improved this key factory performance indicator. It therefore improved performance in this area hence a positive impact.

5.2 Recommendations and conclusion.

From the study, it is very clear that ISO 9001:2000 certification impacted differently on the different key performance indicators of Kagwe tea factory company limited. Research
findings indicate that the certification impacted negatively on the factory throughput, costs and conversion factor while impacting positively on the top-grade percentage, production per bush and shareholder’s income. Overall ISO 9001:2000 improved shareholder’s income which is a critical measure of the company’s performance as it denotes improved return on shareholders’ investment.

In conclusion, it is evident from the study that ISO 9001:2000 generally improves the performance of tea processing factories if the case of Kagwe tea factory is anything to go by.
References.

Vonderembse, M.A (2004); *core concepts of operations management*; leyh publishing llc. U.S.A.

Winser, J.D; (2008); *process management creating value along the supply chain*; Thomson lath-western, U.S.A

Stoner, J.A.F( 1992); *Management*; Prentice-hall inc; Englewood cliffs; N.J ,U.S.A

Daft, L (2000); *Management* ; Harcourt college publications, U.S.A.

Basu, R(2004); *Implementing Quality*: A practical guide to tools and techniques; Thomson learning publications; High holbornhouse. 50-51, Bedford row, London.

International Organization for standardization; *Annual Review report (1975).*

http://www.teaauction.com/industry/kenyatea.asp


Owen FJ (1986); *Why quality assurance in a chemical manufacturing company?* Symposium on quality assurance in the process industries, institution of mechanical engineers, Manchester, December 1986.
LETTER OF INTRODUCTION

TO THE RESPONDENTS

RE: RESEARCH PROJECT

I am a postgraduate student at Kenyatta University undertaking a research project as part of the requirements of the degree of master of business administration (MBA). The topic of my research is Impact of ISO 9001:2000 certification on the performance of tea processing factories in Kenya: A case of Kagwe tea Factory Company Limited.

Your tea factory has been selected for this study. Any information provided will be treated in strict confidence and will be used solely for academic purpose.

Your corporation to make this study a success will be highly appreciated.

Yours faithfully,

Elijah N Njue
APPENDIX 2: QUESTIONNAIRE

KENYATTA UNIVERSITY
SCHOOL OF BUSINESS

Course: Master of Business Administration (MBA) – strategic management


A case of Kagwe Tea Factory Co.ltd

All information given will be used for academic purpose only and will be treated with a lot of confidentiality.

Note: You are not obliged to answer all questions

Your Name............................................. (optional)

Designation...........................................

PART A: GENERAL BACKGROUND INFORMATION.

1. When was this factory commissioned? ......................

2. Do you have any other business other than tea manufacture? [Yes] [No]. Tick appropriately.
3 Is Kagwe tea factory CO. Ltd a private or public company?  [private public]

4. How many shareholders does Kagwe have? ..............................................

5. When was this factory certified for ISO9001:2000? ..............................................

6. Which of the below objectives were you aiming to achieve by implementing ISO 9001:2000 standard? (✓ tick appropriately)

- Cost reduction
- Efficiency improvement
- Improved shareholders income
- New markets
- Enhanced customer satisfaction

Any other? state

7. How much did it cost the company to implement ISO 9001:2000 in Kshs

(Tick ✓ appropriately)

< 500,000
501,000 – 1,500,000
> 1,500,000

8. Has ISO 9001:2000 improved the way you work? (tick ✓ appropriately)
9 (a). Did you hire a consultant during the implementation stage? (tick (✓)
appropriately)

Yes

No

(b). How long did it take the company to get the certification? (tick (appropriately)
a) 0-6 months  

b) 7-12 months  

c) 13-16 months  

d) 17-24 months  

e) Over 24 months  

10. Which was your certification body.................................

11. Would you recommend another tea processing factory to undergo the ISO 9001:2000 certification? (tick (appropriately) Yes  No
12. What has been your production costs for the following years:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Cost (kshs/kgMT)</th>
<th>Financial Year</th>
<th>Cost (kshs/kgMT)</th>
</tr>
</thead>
</table>

13. What has been your throughput for the following years:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Throughput (kgs/hr)</th>
<th>Financial Year</th>
<th>Throughput (kgs/hr)</th>
</tr>
</thead>
</table>

14. What has been your percentage top grade percentage for the following years:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>% Top Grade</th>
<th>Financial Year</th>
<th>% Top Grade</th>
</tr>
</thead>
</table>
16. What has been your out-turn /conversion factor for the following years:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>% Out-turn</th>
<th>Financial Year</th>
<th>% Out-turn</th>
</tr>
</thead>
</table>

17. What has been your total shareholders income for the following years:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Shareholders Income(Kshs)</th>
<th>Financial Year</th>
<th>Shareholders Income(Kshs)</th>
</tr>
</thead>
</table>
APPENDIX 3: INTERVIEW SCHEDULE FOR MANAGEMENT STAFF.

KENYATTA UNIVERSITY

SCHOOL OF BUSINESS

Course: Master of Business Administration (MBA) - strategic management


A case of Kagwe Tea Factory Co.ltd

NB: All information given will be used for academic purpose only and will be treated with a lot of confidentiality.

1. As a manager how has ISO 9001:2000 certification helped you in accomplishing your day to day managerial duties.

2. How do you ensure that ISO 9001:2000 principles are observed by all employees in Kagwe tea factory company limited?

3. Do you think ISO 9001:2000 was a worth investment by kagwe tea factory? And if yes why?

4. Which are your main company objectives?

5. How does ISO 9001:2000 help in achieving your company objectives?

Thank you