INFLUENCE OF TOTAL QUALITY MANAGEMENT PROCESSES ON IMPROVEMENTS OF FOREST PRODUCTS. A CASE OF KEIYO SOUTH SUB-COUNTY, KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for the award of any degree in any other institution of higher learning

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This project has been submitted for examination with our approval as the University supervisors.

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DEDICATION

This research project is dedicated to my wife Irene Rotich and my children namely Dorothy, June, Mercy, Sharon and Anne whose moral and material support encourage me to complete this project.

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LIST OF ABBREVIATIONS AND ACRONYMS

ISO	- International Standardization Organization
IEA	- International Energy Agency
USFS	- United States Forest Service
TQM	-Total Quality Management
KFS	- Kenya Forest Service

ABSTRACT

This study sought to analyse the influence of Total Quality Management (TQM) processes on improvement of forest products in Keiyo South Kenya Forest Service forests in Elgeyo Marakwet County, Kenya. The study looked into the influence of TQM on improvement of Forest products. The TQM constructs to be studied were planning, control, staff motivation and staff training. The dependent variable of the study was the improvements of forest products which included timber emanating from exotic species of cypress, pine and Blue gum trees which were the main tree species planted for timber production in Kenya. The objectives of the study were: To determine the influence of planning on quality of forest products, to determine the extent to which staff training influence the quality improvement of the forest products, to assess the influence of control on the quality improvement of forest products and to establish the influence of motivation of staff on quality improvement of forest products. Both quantitative and qualitative approaches were applied to process, to analyse and interpret the data collected from the field. Data was analysed using descriptive statistics and inferential statistics. Descriptive statistics was used and included; percentages, frequencies, standard deviations and means. This study was prompted by the fact that plantation establishment is a long term enterprise spanning a duration of between 20 to 30 years before returns are realized. This calls for continuous monitoring and evaluation of processes if quality products (timber) are to be achieved. Various conceptual; theories related to this research were discussed to reinforce the study. These theories which were key to quality management system are PDCA (Plan-Do-Check-Act), which was made popular by Dr. W. Edwards Deming (1994), Zero Defects concepts which was pioneered by Philip Crosby (2001), Benchmarking concept (Mahamed A, 1995) and Kaizen Philosophy which is a Japanese word for maintenance and improvement. The conceptual framework clarifying relationship between dependent and independent variable; together with their indicators and constructs respectively are amplified. Significance of the research study is clearly stated in terms of information as to whether the organization activities are moving on the right direction towards the production of quality forest products. The study employed survey research design that used questionnaires. Sampling was done using Census enquiry sampling design which included all the workers in the Kenya forest service from Keiyo South Sub county were interviewed. Data coding was done upon the return of the questionnaires from the field. Data entry and analysis was done by the help of Statistical Package for Social Sciences (SPSS) version 20. In addition, qualitative data from open ended questions in surveys and interviews were processed and analysed. The results of the data analysis process were presented using tables. The study targeted a total of 60 respondents which comprised of 12 respondents from Kipkabus, 16 respondents from Kaptagat, 15 respondents from Sabor forest station and 13 respondents from Penon forest stations of Keiyo South Sub-County. The relationship between the variables was processed through correlation analysis and the following results were obtained. The relationship between planning and improvement of forest products show there is high positive relationship between planning and improvement of forest products, this was proved with the p value = 0.993 and r= 0.000. At 95% confidence level, there was significant relationship between the control process in place and the improvement of forest products. This was so since p=0.544 and r = 0.00 giving us a positive correlation. There was no significant correlation between staff straining and Improvement of forest products. This is because the value of p = 0.075 which was very small compared to 0.5 level of significance. There was no significant relationship between staff motivation and improvement of forest products. The value of p=0.181 indicated a positive relationship but not a significant relationship. In conclusion it was found that KFS was male dominated organisation accounting for 93.3%. It was also an ageing staff where 84.7% of the staff were above 30 years

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Forest products are key in the survival and sustainability of life in the ecological system, with products ranging from medicine fraternity to the construction of homes and all products has some linkage to the forest. The forest industry employs one (1) million workers in the United States of America, these accounts for an approximation of 6% of the total United States Manufacturing industry GDP (Evans and Lindsay, 2005). The Britannica Encyclopaedia (2014) states that Shaowu a city in North-Western China has become the major commercial and distribution point for a large area in the Futun and Jin river valleys in western Fujian, an area rich in forest products and lumber resources.

Dean (2009) while conducting his study in Japan found out that forest product which includes lumber is by far the most commonly recognized tree product. Lumber creates most of the structure of our homes. We may not see it, but it holds up the walls, roof, and floor. Lumbering is a major industry in Japan, where large areas of planted conifers have replaced much of the original temperate forests in the south and deciduous hardwoods in the north. In Europe, some 73% of forest area has production as the primary function, while North America reported only 6% designated for production (FAO, 2005).Globally, 54% of forest area was reported as designated for productive purposes. This figure can be seen as a global estimate of the area of the forest available for the supply of wood and non-wood forest products.

Another forest product is the Tropical woods which accounts for around 40% of total round-wood production, and tropical woods exports account for 25% of world production (Barbier et al, 1994). Europe and North/Central America account for 65% of world industrial round-wood production, with Asia accounting for about 20% and South America accounting for 9%. FAO (2000) statistics suggest that some 1.86 billion m^3 of wood is extracted from forests for fuel-wood and conversion to charcoal. Annually of this total, roughly one-half comes from Asia, 28% from Africa, 10% from South America, 8% from North and Central America and 4% from Europe (Pearce 2005). Smil (1987) puts all biomass energy (i.e. including dung and crop residues) at 15% of world energy consumption. In India forest products have help the growth of

a town known and Dhamatari (Liley, 2009). The town is a rail-spur terminus and a trade centre for agricultural and forest products. Rice and flour milling and shellac manufacture are the chief industries.

The forest products industry in general is characterised by sales of commodity products with push marketing, relatively long lead-times in production and a production processes that generates a relatively high percentage of consequence products (Haartveit, Kozak, & Maness, 2004).The forest products sector has several unique energy consumption attributes that distinguish it from other manufacturing sectors. The forest products industry is the largest user of wood by product fuels, representing 93% of total wood fuel usage by U.S. manufacturing industries (Environmental Protection Agency 2007).

All the things we use and consume are obtained from natural resources which include the Forest cover. Utilization of forest product is key to maintaining the forest at a sustainable level. This can only be done at quality management process of the resources and capital at disposal to ensure the forest cover is not depleted. The United States of America losses seventh of its forest cover by the year 2005 (FAO 2005).Nigeria is recorded to have the highest rate of deforestation in the world (Butler 2005). This has lowered the amount of rubber products compared to its west African neighbours such as Ghana and Liberia.

Goldemberg et al. (1987) suggests that some 43% of developing countries' energy consumption comes from non-commercial sources, while Miller and Tangley suggest 26% for fuel-wood alone. The International Energy Agency (1998) estimates that 11% of world energy consumption comes from biomass, mainly fuel-wood. IEA (1998) estimates that 19% of China's primary energy consumption comes from biomass, the figure for India being 42%, and the figure for developing countries generally being about 35% (UNDP et al., 2000). All sources agree that fuel-wood is of major importance for poorer countries and for the poor within those countries. While fuel-wood may be taken from major forests, much of it comes from woodlots and other less concentrated sources. Extraction rates may or may not be sustainable, depending on geographic region. Hardly any fuel-wood and charcoal is traded internationally.

Management, in business, term used to describe the techniques and expertise of efficient organization, planning, direction, and control of the operations of a business (Redmond 2008). Quality on the other hand according to Deming (1993) is an essential identifying nature or

character of somebody or something. Total quality management therefore can be defined as the organization and planning of essential characters and products in order to seek out the best from these products. The United States Forest Service (USFS) experimented with total quantity management (TQM) principles in 1989. The practice emphasized on team work, employee empowerment in decision making and a greater customer focus (Bullis, 1989). In response to increasing legislative requirement and public participation, the US Forest Service has experimentally adopted total quality management principles in its Eastern Region, since 1989. TQM implementation saved the region $3 million by eliminating paper work and red tape.

Africa and South America distinguish themselves by showing distinct decline in forest cover. For Africa the direction for the past twenty years is clear even though the rate of deforestation seem to have declined over last few years. However forest cover alone does not tell us what kinds of forests we have, what benefits they might provide, how well they are managed or if they are degenerated(FAO, 2010). In the Lake Victoria basin problems among other things such as soil erosion and declining soil fertility have been attributed to loss of forest cover (World Agroforestry Centre, 2006). The situation is described by Maitima, Olson, Mugatha, Mugisha, & Mutie (2010):The land was formerly rich in natural forests but this resource has been severely over-exploited. Deforestation combined with unsustainable agricultural methods has resulted in widespread, increasingly conspicuous land degradation. (Maitima et al 2010). This clearly indicate some lack of quality management in the Forest Products from the developing nations

Kenya currently has approximately 1.24 million hectares of closed canopy indigenous forest (Bosibori 2009). In Kenyan forests, TQM practice is at its infancy stage where the service was ISO certified in 2012 (ISO 9001:2008). A forest product is any material derived from a forest for direct consumption or commercial use, such as timber, paper or forage for livestock (FAO, 2012). Wood by far the most dominant forest product, is used for many purposes such as wood fuel (firewood or charcoal) or the finished structural materials used for the construction of buildings, or as raw materials in the form of wood, pulp that is used in the production of paper. All other non wood products derived from forest resources comprising a broad variety of other forest products are collectively described as non-timber forest products.

Taylor (2006) states that in Kenya the enactment of the Forest Act 2005 have led to dynamic reform of the forestry sector. The formation of the semi-autonomous Kenya Forest

Service (KFS) and other institutional changes, have meant that KFS can now determine their own direction, vision and mission including mobilizing finance to achieve their stated goals. Already KFS is actively seeking partnership with a myriad of likeminded stakeholders in the forestry sector including community organisations, NGOs, the private sector and other government organisations and parastatals in order to come up with a shared way forward (Secretariat of the Convention on Biological Diversity 2009).

In order to achieve the goals set for Vision 2030 Kenya needs to maintain the natural systems that support agriculture, energy, rural livelihoods and tourism e.g. Kenya had set the target of increasing forest cover to 4% by 2012. Kenya is also a signatory to the UN Convention to Combat Desertification. Unsustainable land use systems, exacerbated by climate change have resulted in serious land degradation in ASALs in Kenya and these processes are closely linked to poverty and threatening food security.

The background information shows the importance of forest products and with total quality management the country is expected to earn not only in the local market but as well as internationally. With good management system in place, forest cover is expected to increase and more products to be obtain. This will help save a lot of natural calamities that have hit Kenya in the past few years such as unpredictable rain patterns, prolonged drought, even clashes for resources between the local community and the wild animal in the Mau forest that leads to land degradation.

1.2 Problem Statement

Cyprus, pine and eucalyptus trees are mainly planted for timber production in Kenya. These trees are the main revenue earners to Kenya Forest Service and in the larger extent major contribute to the country's economy. Cypress and pine takes 30 years to mature and be ready for timber production while Eucalyptus takes at least 12 yeas to yield sawn timber, transmission process and firewood. Sawn timber with knots, cracks or rotten are of poor quality and always rejected by customers. These timber of poor quality have low mechanical strength and a major cause of building collapse which may result to untold loses to the users. These timber defects are rampant in Kenya and needs to be rectified.

The major cause of timber defects in Kenya are poor management of our forest through neglect of managing for silvicultural activities like seed procurement, proper planting of tress in

the field, regular pruning, thinning and creeper cutting. Regular implementation of these process needs control; measures and tools to make sure that all process move in desired direction. These improvements [processes require well trained and motivated staff who will be available to tend these trees effectively to maturity age.

All required silvicultural operation need to be done at right time and according to stipulated technical orders throughout the life of the trees. Any skipping of some operation in the life cycle of these trees will finally affect the timber quality. It is therefore for this reason that I undertake to determine the influence of total quality management process on the improvement of forest products particularly timber.

1.3 The purpose of the study

The purpose of this study was to explore the influence of TQM processes on improvement of forest products in Keiyo South Sub- County, Kenya.

1.4 Objectives of the study

The study aimed to achieve the following objectives:

1. To determine the influence of planning on improvement of forest products in Keiyo South Sub-County, Kenya
2. To determine the extent to which staff training influences the improvement of forest products in Keiyo South Sub-County, Kenya.
3. To establish the influence of staff motivation on improvement of forest products in Keiyo South Sub-County, Kenya.
4. To assess the influence of control on the improvement of forest products in Keiyo South Sub-County, Kenya.

1.5 Research questions.

The study was guided by the following questions:

1. What is the influence of planning on the improvement of forest products in Keiyo South Sub-County, Kenya?
2. To what extent does staff training influence the improvement of forest products in Keiyo South Sub-County, Kenya?
3. How does staff motivation influence the improvement of forest products in Keiyo South Sub-County, Kenya?
4. Does control has any role on improvement of forest products in Keiyo South Sub-County, Kenya?

1.6 Significance of the study.

Forest product trade tends to concentrate decision-making power over (and benefits from) forest management in the hands of powerful interest groups, rather than spreading it to include poorer and less powerful players (Arnold et al. 2006). It ‘‘magnifies’’ the effect of governance, making total quality management of forest bad and making bad forest governance worse. Africa's forest product exports to China command a higher share of China's total imports by value (4.9%) than they do by volume (2.9%), suggesting the export of relatively higher value timber to China relative to other supplying countries (Canby et al 2008).The findings of this study will be of great help to Legislative bodies as well as the Kenya Forest Service (KFS) top management. It will inform them whether they are on the right track towards the production of quality forest products. The findings will also eliminate customer dissatisfaction regarding poor forest products. It will also inform the top management on areas they are excelling and those they are failing in Total Quality Management (TQM) implementation.

The management of KFS will be guided on the processes which lead to the production of high quality and quantity of forest products. The research will be an eye opener to top management in order to impress TQM tenets more than before. Above all TQM practice will enhance marketability and profitability of Kenyan forest products both within the country and internationally. The study will be of great help to future researchers who will be interested on TQM practices in any organization.

1.7 Limitations of the study:

There was limitation which the researcher came across during the study. Some of the staff members withheld information for fear of reprisal from their seniors for divulging sensitive information. The time and lack of funds to carry out this project to its logical conclusion was a limiting factor. Some of the forest stations were remotely placed with impassible roads during rainy seasons.

Some respondents were adamant and unwilling to spend their limited time on presenting unpaid for information. Some of the respondents were not enthusiastic in filling of questionnaires due to their low education background. The researcher found it difficult to receive back all questionnaires in time while other responds did not return them at all.

1.8 Delimitations of the study:

The study examined the influence of TQM processes on improvement of forest products in Keiyo South forest stations. The research was done in selected Keiyo South forest stations. This project commenced from early April 2005 to end of June 2015. The investigation was limited to total quality management in production of round logs which is the main product of Kenya forest service products. Whatever components that were not studied here will form gaps for future researchers to undertake. The data was collected by use of questionnaires, analysis of secondary data and interview schedules.

1.9 Assumptions of the study

For the purpose of this study, Kenya Forestry Service staff were assumed to have clues on quality management processes in their respective places of work. All respondents were honest and candid enough to provide truthful information. Those findings from forest stations of Keiyo South Sub – County can be replicated on other stations in Kenya and will give the same results.

1.1.0 Definition of key terms:

Quality – It is fitness for purpose. It is subjective attribute and may be understood differently by different people.

Total Quality Management: - Is a management approach that originated in the 1950's and has steadily become more popular since the early 1980's. Total quality is a description of

culture, attitudes and organization of a company that strives to provide customers with products and services that satisfy their needs (Britannica Encyclopaedia, 2014)**.**

Control– It is a systematic effort by business management to compare performance to predetermined standards, plans or objectives.

Motivation- It is ones direction to behaviour or what causes a person to want to repeat behaviour.

Planning– It is the process of thinking about and organizing the activities to achieve a desired goal.

Training- Developing in oneself or others, any skills and knowledge that relate to specific useful competencies.

Pruning- It refers to removal of parts of woody plants, usually branches or branch tips, to relieve the burden on the remaining parts of the plant, to cut out diseased or broken parts, to increase the quantity and quality of flowers or fruits, to train individual parts to positions structurally favourable to the health of the plant, or to shape the plant into some artificial form

Knot Free Timber- it is a prime timber of high quality resulting from early pruning of branches of a tree

Thinning- refers to the removal of some plants or parts of the plant to make room for growth of the plant or other plants.

Re-spacing- It is the removal of natural regeneration of trees to give room to the planted trees.

Creeper Cutting- It is the removal of climbers and undergrowth in a plantation of desired species.

Pruning Schedule: It is a detailed pruning plan per tree species right from planning to harvesting.

Thinning Schedule – It is a detailed thinning plan per tree species right from planting to harvesting

Compartment register- It is an accountable document detailing the prescriptions of operations in a plantation (sub compartment) and its subsequent implementation of prescriptions.

Quality- It is fitness for use by customer

Quality Improvement- It is a process aiming at attainment of unprecedented levels of performance, which are significantly better than the past level.

Quality Planning- Activities that establish the objectives and requirements for quality, it usually involves the four Ms (Man, Machine, Material and Method)

Weeding- It refers to the free of chosen vegetation from competition from other plants.

Timber- Refers to wood that has been sawn into boards, planks, or other materials for use in building, woodworking, or cabinetmaking.

Forest product- these are the round logs of cypress, pine and eucalyptus produced in the forest through their establishment and management.

1.1.1 Organization of the study:

The study was organized into five chapters. Chapter one consist of the background of the study, statement of the problem, research objectives, research questions, significance of the study, delimitations of the study scope of the study and organization of the study. Chapter two entails the literature review for the study depicting the planning, staff training, Motivation and Control of resources for improvement of forest products, chapter three carries research design, study area, target population sampling procedure and sample size, data collection instruments, validity and reliability of research instruments. Chapter four contains the data analysis, presentation and discussion of the findings. The conclusion and recommendations will form chapter five of this research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The chapter highlights what other scholars and researchers have done in respect to total quality management in relation to improvement of forest products. The chapter discussed loopholes in knowledge and implementation of Total Quality Management (TQM) in conformity to the title and objectives of the research topic. The review therefore, magnified the influence of TQM practice on the quality of products of various companies as perceived by various authors. A critique of the studies and the gap was then presented.

2.2 The concept of improvement of forest products.

Forests worldwide are known to be critically important habitats in terms of the biological diversity they contain and in terms of the ecological functions they serve. Taking species counts as an illustration of biological diversity, the number of described organisms totals some 1.75 million, and it is conjectured that this may be just 13% of the true total, i.e. actual species number perhaps 13.6 million (Hawksworth and Kalin-Arroyo, 1995; Stork, 1999). What fraction of this uncertain total resides in the world's forests is unknown. Wilson (1992) has suggested that perhaps half of all known species reside in tropical forests alone, and WCMC (1992) conjectures that the majority of yet-to-be-discovered species are in tropical areas. Whatever the precise number, forests, and tropical forests in particular, are major locations for biological diversity. The values of forests therefore embody the values of the biological diversity they contain since it seems unlikely that the vast majority of the biological resources in question could occupy non-forest habitats.

The forest products industry will continue to seek to control energy costs in an effort to maintain its competitive position in the global market, and the industry views increased biomass utilization as a key tool for achieving that objective (Environmental Protection Agency, 2007). Delany (1993) states that in US, total quality management (TQM) is indeed applicable in policy setting and decision making in US forest service where it has employed key principles of quality management to the process of setting new direction and strategy for the agency. In Britain the successful implementation and adoption of TQM practices requires planning, time and efforts

where the common TQM practices include top management, employee involvement, customer focus, process management, knowledge and education are important for continuous and industry wide improvement (Fotoponlos and Psomis, 2009). Only 10% of world forests are certified where British Colombia has more area certified than any other jurisdiction in the world.

This therefore means that the species of trees and organisms that facilitate the growth of the forest products should be developed in a manner that facilitates improvement of the forest. Forests are essential for human survival and well-being. They harbour two thirds of all terrestrial animals and plants species. They provide us with food, oxygen, shelter, recreation, and spiritual sustenance, and they are the source for over 5,000 commercially-traded products, ranging from pharmaceuticals to timber and clothing. The biodiversity of forests—the variety of genes, species, and forest ecosystems—underpins these goods and services, and is the basis for long-term forest health and stability (Secretariat of the Convention on Biological Diversity. 2009).

Soil moisture conditions are generally favourable at the time when the growing season is about to begin, while dorman stock is less subject to mechanical injury and physiological shock (Steill, 1976). In the lake states of America, plantation has been made with the spacing between tree varying from 0.9m ×0.9m to 3m ×3m (Kittredge, 1929).Pruning is a silvicultural practice, refers to the removal of the lowest branches of the young trees so that the clear knot free timber wood can subsequently grow over the branch stubs. Clear knot free timber has high value. Pruning has been extensively carried out in the Radiata pine plantations of New Zealand and Chile (Smith, 1997). Artificial pruning is where people are paid to come and cut the branches.

Besides the lumber shipments from the western states, in 1999 about 235 MMBF of southern pine was shipped to California (SFPA Industry Statistics 2000). Due to inadequate statistics, it is difficult to assess how much softwood or hardwood lumber from other U.S. states is exported to California in any given year.

Canada is the world's largest lumber exporter and a majority of its lumber is exported to the United States. The combined softwood and hardwood lumber exports from Canada directly to California in 1999 were 383 MMBF (Statistics Canada 2001). The volume of Canadian lumber consumed in California probably is significantly higher, but some of the lumber is shipped to California through other states, such as Washington and Oregon, and so appears in volumes received in California from these states. Lumber is also imported from other countries,

but documenting these trade flows is difficult because most countries do not separate the U.S. states in their customs statistics; they simply show total exports to the United States.

Thinning is the cutting down and removal of a portion of trees in a forest crop. It is carried out primarily to provide more growing space for the remaining trees, which leads to an increase in volume of individual trees. By altering standard density, foresters can influence the growth quality and health of residual trees. When considering intensive conifer plantations designed to maximum production, it is essential to remember that tending and thinning regimes and wind and snow damage intimately related (Navratil et al, 1991).

Kenya's forests are important for economic development, environmental services and cultural values. They provide utility products such as timber; pulp and paper, poles and fuel wood both for industrial and domestic use (KFS, 2005). Forest policy addresses industrial forest development, where mainly exotic trees of cypress, pine and eucalypts are professionally planted and made to undergo cocktail of treatments in their lifetime to maturity. These treatments are: planting, weeding, successive pruning, thinning and re-spacing. The treatments will ensure that the forest plantations are sustainably managed to produce timber of high quality to meet or exceed customers' expectation.

Kenya Forest Service Technical Orders prescribing treatments for various tree species are outlined and should strictly be followed by the service personnel if quality forest products are to be achieved (Forest T.O. no's 57, 17 and 49, 2000). Silviculture which is the practice of controlling the establishment growth, composition, health and quality of forest to meet diverse human needs are practiced in the forests world over. No matter how forest as a science is constituted, the kernel of the business of forestry is silvilcultural, as it includes direct action in the forest and in it all economic objectives and technical consideration ultimately converge (Kostle, 1956)**.** The classical silvicultural literature unanimously advocates spring as the time to plant bare root stock with lifting and out planting taking place while the trees are still apparently dorman (Sutton, 1984).

2.3 Policy In Place

Much critical intergovernmental policy work within the sector has been done. Short-term priorities are reaching agreement on how countries should monitor, assess, and report on forests and reaching a conclusion on a legally binding instrument. More attention should now be focused on policy implementation at the regional, eco-regional, and national levels. It is easier for countries to identify issues of common interest at the regional and eco-regional levels; in many cases, institutions or processes are available that can be used. More attention is needed in the integration of agreed forest management principles and practices in multilateral financial institutions, trade rules, and the Global Environment Facility. Trade in forest products is growing rapidly, involves every country in the world, and is worth about US$330 billion annually. Conventional trade theory predicts economic benefits to both trading partners, which is broadly observed in forest product trade (Sedjo and Simpson 1999; USTR 1999). Three problems complicate matters: unanticipated levels of benefits and costs due to market imperfections; inequitable distribution of those benefits and costs; and disputed values ascribed to different types of benefits and costs, especially between market and non-market values (World Bank 2002; IIED 2003). Different interest groups perceive the relative importance of these problems differently, and consequently promote different initiatives to solve them.

Trade liberalization is the dominant economic paradigm; however, when non-tariff measures and effects of subsidies are taken into account, the net trend internationally is probably slightly toward increased protection rather than liberalization (Rice et al. 2000; Bourke 2003). In addition to forest products trade policy, and macroeconomic policies affecting interest rates, stability, and risk, significant effects are created by other policies. Logging bans displace logging problems to other locations and countries rather than solving problems (Brown et al. 2002). Forest tenure is affected by privatization, and decentralization measures are creating new trade players (White and Martin 2002). Sectors competing for inputs or land dictate whether there are any forest products to trade. Policies that support large-scale agriculture have had particularly significant effects (Hyde forthcoming).

There are more than a hundred regional agreements that affect forest trade in some way (IIED 2003). Regional trade agreements are the most prominent of these, including Asia-Pacific Economic Cooperation, the North American Free Trade Agreement, and the European Union. Regional mechanisms to control illegality in forest trade have also begun to receive support and

provide platforms upon which to develop new ideas. Internationally, influence over trade is dominated by the World Trade Organization negotiations, which have not installed pro-forest principles and clarified forest trade uncertainties. Other international agreements influencing forest trade include those on forestry, climate change, trade in endangered species, biodiversity conservation, core labour standards, guidelines for multinational enterprises, and combating bribery.

2.4 Planning on improvement of forest products.

Encarta Dictionary (2009) defines planning as to work out in advance how something is to be done or organized. Planning is therefore the management function of anticipating the future and the conscious determination of a future course of action to achieve desired results. Planning involves the determination of objectives and results, selection of the best possible course of action to achieve the desired results, time sequence of activities and the resource required to perform the activities. It is the basis of the management process where all other functions of management are designed to attain the goals set under planning. Saleemi (2013) states that planning is the function of each and every manager irrespective of the level of his/her level of operations. Sound plans are essential to effective management because they serve as guides to all management functions.

Lack of well-defined objectives and priorities is the common cause of failure that is failure to plan is planning to fail. According to Oakland (2006), the task of implementing TQM can be daunting and the chief executive faced with this may draw little comfort from the quality professionals. The first decision is where to begin and this can be so difficult that many organizations never get started. Without a strategy to implement TQM through process management, capability and control the expanded effort will lead to frustration (Oakland, J. 2001).

Individual effort is required in improvement but it must be coordinated and become involved with the efforts of others to be truly effective. The implementation begins with the drawing up of a quality policy statement and the establishment of the appropriate organizational structure both for managing and encouraging involvement in quality through team work. Planning improvement involves all managers but a crucial early state involves putting quality

management systems in place to drive the improvement process and make sure that problem remains solved forever using structured corrective action procedures.

An organization may off course have already taken several steps on the road to TQM. If good understanding of quality and how it should managed already exists, there is top management commitment, a written quality policy, and a satisfactory organizational structure, then the planning stage may begin straight away (Gibson, 2007). TQM may be integrated into the strategy of an organization through an understanding of the core business processes and involvement of the people. This leads through process analysis, self-assessment and benchmarking to identify the improvement opportunities for the organization, including people development (Rajan, 2006).

Forest management plans include recommendations to achieve the land owners objective and desired future condition for the property subject to ecology, financial, logistical and other constraints. On some properties plans focus on producing quality wood products for processing or sale. Hence tree species, quantity and form, all central to the value of harvested products quality and quantity, then to be important components of silvicultural plans (Young, 1982).The Costa Rican government currently disburses money for reforestation, sustainable forest management and forest preservation (Pearce, 2001). Howard and Valerio (2001) show that, unless stumpage prices rise, sustainable timber management does not compete with the land uses for Costa Rica. This shows that management is important if profits are to be observed.

In Western Australia forest products commission has been put in place to spear head tree harvesting plans (Forest products commission of Western Australia, 2014). Britain enacted forestry commission in 1900 to check the declining of wood land resources through planning for continuous improvement of the structure of Britain forests (British forest policy, 1920). Planning is the process of thinking about and organizing the activities required to achieve a desired goal. It is deciding in advance what to do. This bridges the gap from where the organization is to where it wants to be (Owen, 1997). Planning begins with today realities, but its focus must always be on tomorrow's opportunities (Saffold, 2005).

Planning is an attempt to let future priorities have an influence on today's activities. Trees take a long time to grow, so decisions have long term impacts on forests and water quality.

You have to consider your resources, skills time constraints and applicable regulations in your location before you create a flexible plan that you can follow to reach your goal for your forest. The quality of your forest may depend on active forest management of your forest.

Planning is not a single event but a series of continuous steps leading to desired goal. Forest management plan guides activities for decades, providing continuity through successive generations of owners (Saffold, 2005).The plan can either be short term or long term as one desire. The first step is to determine your priorities set goals and identify the management activities to reach those goals.

2.5 Staff training on improvement of forest products.

Developed countries have more resources than do developing countries to invest in basic and vocational education, training programs, and higher education. As a result, workers and managers in developed economies typically receive more education and training (Saez and Heintz, 2008). Employees require some training in order to manage the enlargement of their work role following the delegation of responsibilities for quality. They also require some training in non-technical skills to be able to participate in quality improvement activities (Schonberger, 1994). Training for quality management requires development of specific skills sets that support quality management practice (Dertouzos, Lester and Solow, 1992). One of the Deming's 14 point principles was that all employees must be trained in quality improvement techniques. With the rapidly changing nature of the business world and the need to maintain competitive advantage, organizations need to ensure that staff are fully trained not only in knowledge of their products and / or service and technical skills, but also in their human relation skills. There is therefore need for companies in all industrial and commercial sectors to be more serious about training in their people skills and how to work with maximum effectiveness as part of a team (Mullins L. 2013).

Training and development should be an integral part of the business strategy. Employees for the apart should receive positive recognition for good training achievement through for example increased job satisfaction, higher wages and related systems of career progression. Investors in people is recognized as one of the most successful quality awards ever introduced. It can be viewed as part of a wider quality management process with natural progression to TQM .

The purpose of training is to improve knowledge and skills and to change attitudes. It is one of the most important potential motivator and can lead to many possible benefits for both individuals and organization (Mullins L. 2013). Training increases the level of individual and organizational competence, give a feeling of personal satisfaction and achievement and broaden opportunities for career progression. It helps to improve the availability, quality and skills of staff. Training can easily become an agenda for conformity and the status quo- good at instilling uniformity and compliance with someone else's model of current best practice (Lucas, E 2003).

However, although the potential benefit of training may appear obvious, it does not necessarily follow that training, will lead to improved performance. Training has to be relevant to the needs and requirements of the organization. Management development also require a combination of on the job training through project work, coaching and trial periods and off the job learning through external short learning. Employee involvement is an important approach to improve quality collective growth (Besterfield, 2013). Involvement of employees is a crucial factor in achieving higher quality collective business growth. Total Quality Management (TQM) and human resource management (HRM), has been an important theme in management and business research for the past few decades due to its potential to affect a range of organization / by and individually desired outcomes. Human resource management and TQM are becoming more interlink (Boselie and Wiele, 2002). The human resource professionals play a central role in creating and communicating the TQM visions of the company (Palo and Padhil, 2005).

A fruitful cooperation between human resource and TQM can produce better organization results. It is necessary to consider employee's behaviour, attitudes and values for any TQM programme to be successful. There is to recruit staff according to their suitability for the job. More sophisticated methods of recruitment and selection techniques are needed for TQM (Witkinson, 1994). Training is also an important investment into human capital (Becker, 1964), and thereby helps to increase the future earnings (Mincer, 1974).

Successful recruitment and selection of employees with proper knowledge, skills compatible with a TQM philosophy can be a driving force supporting continued program effectiveness (Clinton, 1994). According to Bosibori (2012) Inadequate financial allocation to meet the Vision targets and to support on-going reforms including drafting of forest rules and regulations; staff recruitment and programme support has also constrained development of the sector. Business

associations play a particularly complex role, managing the system by monitoring the quality of training provided by firms in the dual system in Germany (Brand, 1998; Gill & Dar, 2000; Rauner, 1998).

This implies, according to Doran (2001), the identification of competences derived from a TQM strategy and the use of multi-method selection. The goal of recruitment and selection process should be to identify prospective employees who could work in teams, have problem solving attitudes and the forthcoming with ideas to improve processes. Forestry, management of forestlands for maximum sustained yield of forest resources and benefits. (Tisdale, 2008)The management of forestlands therefore helps to ensure that wooded areas are used for maximum benefit according to their nature.

2.6 Motivation of staff on improvement of forest products

Forestry comprises such specialties as dendrology, silviculture, forest protection, mensuration, engineering, utilization, and management. TQM emphasizes the importance of people as the key to quality. Human resource management and quality management are converging to give total quality. There has been too much reliance on systems. Although systems are necessary, they are only effective as people who designed them (Lammermeyr, 1991). TQM requires the creation of cooperate identity and a supportive environment. It involves setting the highest standards for quality at lowest cost; effective training including team building throughout the organization; integrating systems and technology with people and the motivation, participation and commitment of staff at all levels of the organization (Oakland, J.S. 1994). Motivation is an integral part of direction. While directing is subordinate, a manager must create and sustain in them the desire to work for the specified objectives. A good motivation system releases the immense untapped reservoirs of physical and mental capabilities. Poorly motivated people can nullify the soundest organization. By satisfying human needs motivation helps in increasing productivity. Therefore the higher the level of motivation the greater is the degree of goal accomplishment. Satisfied workers take interest in new organizational goals and are more receptive to changes that the management wants to introduce in order to improve efficiency of operations. In view of the multiplicity of human needs, there cannot be a single source for motivation for all. Therefore, there must be a motivational system which induces employees to

work efficiently and bring about increase in productivity of labour. Human needs may either be primary or secondary in nature (Salemi N. 2013).

Experience has shown that there is often variation in individual efforts and performance even though people with similar capabilities are working in identical situations. This is attributable to the extent to which a person feels motivated to expend mental and physical effort to accomplish a given task. According to Maslow, people seek satisfaction of physical needs first. So long as these needs are unsatisfied they dominate behaviour. Once they are satisfied to a reasonable degree, the security needs become dominant. This process continues up the need hierarchy.

When employees are not engaged in their work, they can be less productive and provide a lower level of services potentially leading to poor agency performance. Motivation is a theoretical constraint used to explain behaviour. A motive is what prompts a person to act in a certain way. Intrinsic motivation is a natural motivational tendency and is a critical element in cognitive, social and physical development. It is eagerly engaging in work in absence of reward for example students who engage in tasks to improve their skills. On the other hand extrinsic motivation refers to the performance of an activity in order to attain a desired outcome. It comes from influence outside of the individual. Usually extrinsic motivation is used to attain outcomes that a person would not get from intrinsic motivation. Common intrinsic motivation is rewards for owing desired behaviour.

The ultimate success of re-engineering, or other approaches such as TQM, depends on the people who do the work. The difficult and often neglected part of such initiatives is leading and managing behavioural change with those who interface with the new technology or new initiatives. Attention must be given to removing barriers to motivation and to a greater recognition of the human element including the resistance to, and fear of change (Reis, D. and Pena, L. 2001). Total quality cannot be “managed” in the traditional, that is supervise and control, sense of the word because it involves factors such as commitment, purpose, vision and trust that are not amenable to mechanistic prescription. Quality can and must be, managed. Total quality however must be encouraged to evolve (Thomas, B. 1995). The commonly held wisdom of supporting TQM with only non-monetary rewards – such as certificates, letters of appreciation, merchandise and or celebration events- is not enough. If managers want better

performance from TQM, they must implement supportive monetary reward practices. Firms with such practices in place report stronger organizational performance (Allen R. and Killman, R. 2001). Proper attention to human resource issues is an essential requirement for the successful implementation of the TQM (Redman, T. 1995). World standards of organizational effectiveness are not achievable without fully developed and committed people at all levels within an organization. New technologies, new systems, and new concepts may of themselves produce some improvement in effectiveness and hence competitiveness bur even in the short term the improvement will be stunted without an organizational culture which engenders commitment of people across the organization (James, G. 1991).

2.7 Control and improvement of forest products.

According to Shea and Howell (1998), the preferred structure of organization that implement TQM balances the need for control of activities with flexibility needed to respond and adapt quickly to the market place. It is thus important to assess organizational structure when evaluating an organization's TQM implementation. Given the complexity of implementing TQM in an organization, it is important to assess the degree to which TQM practices have been implemented (Westphal et al, 1997). Organization require a certain amount of conformity as well as the integration of diverse activities. It is the function of control to bring about conformance to organizational requirements and achievement of the ultimate purpose of the organization (Stern, S. 2002). According to Tulgan (2011), control is one of the three factors that should guide reward and incentives in the work place of the future. It is critical to make very clear individual contributors exactly what performance- what results, within what guidelines, parameters and datelines – the organization needs, and will therefore reward (Lilley, D. 2002). Management control is primarily a process for motivating and inspiring people to perform organizational activities that further the organizational goals. It is also a process for detecting and correcting unintentional performance errors and intentional irregularities such as theft or misuse of resources (Steward, R. 1999). Control also is a basis of training needs, the motivation to achieve standards and for the development of the individuals. While most people may not wish to have them applied by other people to their own performance, they recognise the need for and usefulness of control systems. Control is required by employees for feedback about task performance, how performance will be measured and where reward systems are based on performance (Gretton, I, 1995).

Every organization has control systems that co-ordinate the exercise of decisions rights that are dispersed among individuals. Control systems also serve another important function in the organization; They measure how effectively decisions have been translated into results. This feature of control systems relates to goal achievement of the company. In this perspective, control systems are about influencing the behaviour of individuals in the interests of the cooperation (Sterns, S. 2002). Control completes the circle of managerial activities. It involves the planning and organization of work functions, and guiding and regulating the activities of the staff. It provides a check on the execution of work and on the success or failure of the operations of the organization. The whole purpose of management control is the improvement in performance at both the individual and organizational level (Mullins, L. 2013). A major international report undertaken by proud foot Consulting found that poor management in terms of inadequate planning and control, and insufficient day- to- day supervision of work is still the largest single reason for lost productivity (Patching, K. 1999).

Whatever the nature of control and whatever form it takes, there are five essential elements in an organizational control system namely: Planning what is desired, establishing standards of performance, monitoring actual performance, comparing actual achievement against the plan target and rectifying or taking corrective actions (Mullins, L. 2013). Developing and distributing a code of conduct is a form of a control that sets out the rules of the behaviour and values with which an organizations senior managers expect their subordinates will conform (Rebegux,P and Poppletton,S. 1999)

Control is one of the managerial functions like, planning, organizing, staffing and directing. It is an important function because it helps to check the errors and to take the corrective action so that deviation from standards are minimized and stated goals of the organization are achieved in a desired manner. Control in management means setting standards, measuring actual performance and taking corrective action.

2.8 Theoretical framework

This study will be grounded on three theories namely Plan Do Check Act theory, Zero Defects Theory, Benchmarking and Kaizen theory.

2.8.1 PDCA (Plan-do-check-act) Shewhart Cycle Theory

PDCA is an iterative four-step management process typically used in business. It is also known as the Deming cycle/Shewhart cycle. The cycle was made popular by Dr. W. Edwards Deming , who is considered by many to be the father of modern quality control. He proposed that business processes should be analyzed and measured to identify sources of variations that cause products to deviate from customer requirements. W.E Deming, recommended that business processes be placed in a continuous feedback loop so that managers can identify and change the parts of the process that need improvements (Deming, 1994). He created a diagram to illustrate this continuous process, commonly known as the PDCA cycle for Plan, Do, Check. Act. Planning involves the establishment of objectives and processes necessary to deliver results in accordance with the expected output while doing part in the implementation of new processes (Crosby, 1979). Checking is the measurement of the new processes in order to compare results against the expected outcome to ascertain any differences. The action part of the cycle is to decide on changes needed to improve the process.

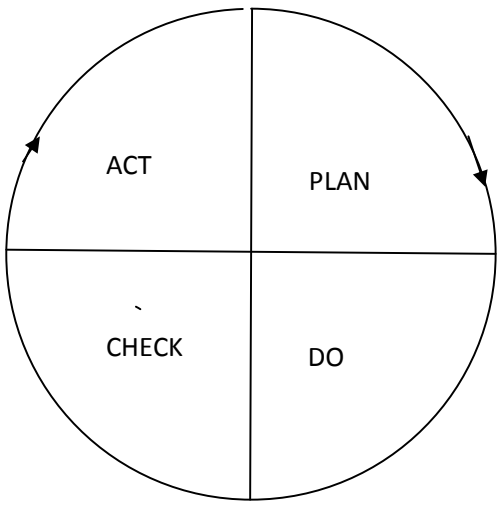

Figure 1 Demining's PDCA cycle.

2.8.2 Zero Defects (Philip Crosby Theory)

Zero defects pioneered by Philip Crosby is a business practice which aims to reduce and minimize the number of defects and errors in a process and to do things right the first time. The ultimate aim will be to reduce the level of defects to zero and therefore maximizing profitability (Crosby, 2001). The concept of zero defects can be practically utilized in any situation to improve quality and reduce cost. However, it does not just happen as the right conditions have to be established to allow this to allow this to take place. A process system or method of working has to be established to allow for the achievement of zero defects. If this process and the associated conditions are not created, then it will not be possible for anyone involved in the process to achieve the desired objectives of zero defects. Any process that is to be designed to include this and finished goods that conform to customer requires and does not fall short or exceed these requirements (Deming, 2013). Cost of conformance can be exceeded unnecessarily if one exceeds customer requirements. The quality manager must be clear right from the start that Zero defects is not a motivational program. Its purpose is to communicate to all employees the literal meaning of words 'Zero Defects' and the thought that everyone should do things right the first time (Crospy P, 1979). Zero defects require a top down approach and therefore management must commit to zero defects. The best intentioned employees cannot provide zero defects if they are not given the tools to do so. The philosophy of zero defects requires a pro-active approach where waiting for flaws to emerge will be too late for correction. One has to recognize that although Zero defects is a destination, circumstances keep changing and this calls for frequent monitoring and evaluation in a continuous, never-ending cycle.

2.8.3 Benchmarking theory

Benchmarking is the process of identifying 'best practice' in relation to both products and processes by which those products are created and delivered. The search for 'best practice' can take place both inside a particular industry and also in other industries. The objective of benchmarking is to understand and evaluate the current position of a business or organization I relation to 'best practice' and to identify areas and means of performance improvement (Mahamed A, 1995). The concept of benchmarking involves looking outward to examine how others achieve their performance levels and to understand the processes they use. In this way, benchmarking helps explain the processes behind excellent performance. When the lessons

learned from benchmarking exercise are applied appropriately, they facilitate improved performance in critical functions within an organization or in key areas of the business environment. Benchmarking should not be considered a one-off-exercise. It must become an ongoing integral part of an ongoing improvement process with the goal of keeping abreast of ever improving best practice (Bogan, C, 1994). Application of benchmarking entails the understanding of existing business processes and analysis of business processes of others. Comparisons of own business performance with that of other are then analyzed before steps necessary to close the performance gap are implemented. Most of the early work in the area of benchmarking was done in manufacturing. Now benchmarking is a management tool that is being applied almost anywhere. Different types of benchmarking exits and the most used ones are; strategic, process, functional, internal, external performance and international benchmarking. Strategic benchmarking is when business needs to improve overall performance by examining the long term strategies and general approaches that have enabled higher performers to succeed. This is most appropriate in re-aligning business strategies has become inappropriate. Process benchmarking focuses on improving specific critical processes and operations. Benchmarking partners are sought from best practice organizations that perform similar work. This as an effect of achieving improvements in key processes to obtain quick benefits.

The functional benchmarking involves business looking to benchmark with partners drawn from different business sectors of activities to find ways of improving similar functions or work processes. This sort of benchmarking can lead to innovation and dramatic improvements. Internal benchmarking focuses on benchmarking operations from within the same organization. However, real innovation may be lacking and best in class performers in more likely to be focused through external benchmarking. This is appropriate where several units within the same organization exemplify good practice and management want to spread this expertise quickly, throughout the organization. On the other hand, external benchmarking involves analyzing outside organization that is known to be best in class. This type of benchmarking can take up significant time and resources to ensure the comparatability of data and information, the credibility of the findings and development of sound recommendations. International benchmarking seeks to identify and analyze best practitioners elsewhere in the world. This is most appropriate where the aim is to achieve world class status or simply because there are insufficient national business against which to benchmark. Performance benchmarking is where

benchmarking partners are drawn from the same sector. This is appropriate when assessing relative level of performance in key areas in comparison with others in the same sector and findings ways of closing gaps in performance (Fifer R, 2009).

2.8.4 Kaizen Theory of management

Kaizen is a Japanese word for' improvement' or 'change for better'. It refers to philosophy that focuses upon continuous improvement of processes in manufacturing, engineering, support business processes and management. The strategy calls for never-ending efforts for improvement involving everyone in the organization-Managers and workers alike. It is daily process, the purpose of which goes beyond simple productivity improvement and humanizes the work place, eliminates overly hard work. Kaizen teaches people how to perform experiment on their work using the scientific methods and how to learn to spot and eliminate waste in business processes. In all the process suggest a humanized approach to workers and to increase productivity (Hamel L, 2010). The idea is to nurture the company's human resources as much as it is to praise and encourage participation in Kaizen activities. The format for Kaizen can be individual, small group, or large group. At Toyota, it is usually is locally a local improvement within a workstation or local area and involves a small group in improving their own work environment and productivity. This group is often guided through the Kaizen process by a line supervisor. Kaizen generates the TQM and frees human efforts through improving productivity using machines and computing power. While Kaizen (at Toyota) usually delivers small improvements, the culture of continual aligned small improvement and standardization yields large results in the form of compounded productivity improvement (Karen M, 2007). Toyota production system is known for Kaizen where all line personal are expected to stop their moving production line in case of any abnormality and along with their supervisors, suggest an improvement to resolve the abnormality which may initiate a Kaizen. Apart from business application of the method both, Anthony Robbins and Robert Maurer PhD have popularized the Kaizen principles into personal development principles (Laraia A, 1999). In his book One Small Step Can Change Your Life: the Kaizen way; Dr. Maurer works at both personal and professional success using the Kaizen approach. In their book: The Toyota Way Field book Jeffrey Liker and David Meier discusses the Kaizen blitz and Kaizen burst (or Kaizen event) approaches to continuous improvement. A Kaizen blitz or rapid improvement is a focused activity on a particular process or activity. The

basic concept is to identify and quickly remove waste key elements of Kaizen are quality, efforts, involvement of all employees, willingness to change, and communication.

2.9 Conceptual framework

The study was based on conceptual framework as shown below.

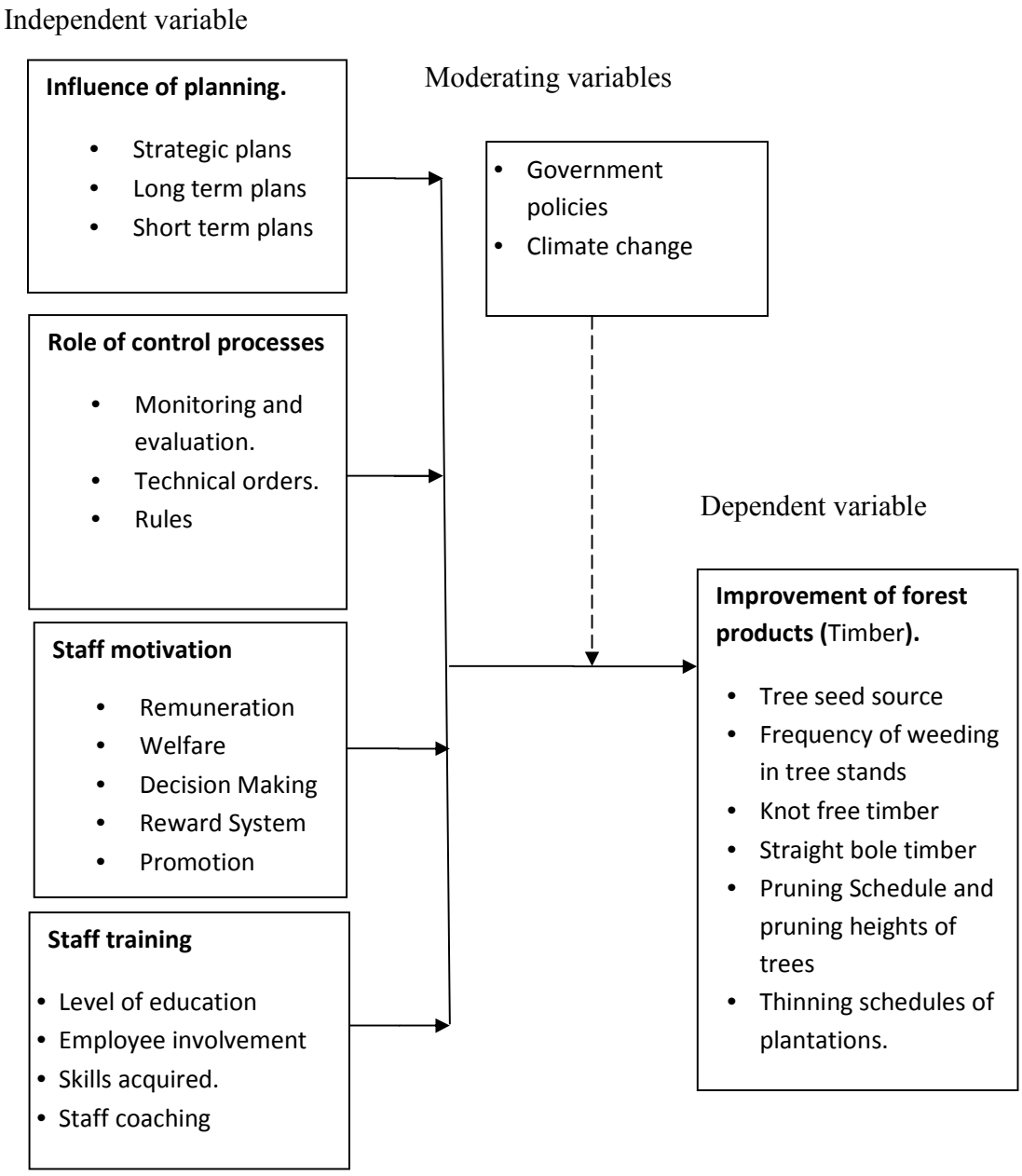

Figure 2 conceptual framework

Planning is a concept of all managerial functions. Toyota a Japanese origin firm used the Gemba Kaizen system of management during their planning. This is supported through the conceptual framework that indicates how strategic planning and long term goals are fused together and make a firm prosper internationally. Unga Limited is the best known millers in East Africa (Forbes Magazine 2013) this is seen through the Plan Do Check Act system that they use in there day to day operations. The conceptual frame work indicates how the Plan do check act theory is actualised through the control of resources, the firm (Unga) has been in existence for more than 100 years since its start in Germany.

2.1.0 Gap in knowledge

Several studies have been done previously with regards to forest products and management systems in place. From the literature review it can be found that little has been done on the total quality management in Kenya forestry service. A lot has been done on the products, the community but little has been done with regards to timber production in Kenyan forests. This study therefore will fill this gap and help the Kenya Forestry Service in capacity building with the findings obtained from this study. This research will be of great help not only to the forest service but to the nation at large since the country will be able to manage its timber production in a sustainable manner.

Thematic area	Author(s)	Method	Main findings	Knowledge Gaps
Planning and objectives development for top level managers	Saleemi, N. A. (2003)	Survey method that targeted top level management in various factories	planning is the function of each and every manager irrespective of the level of his/her level of operations	-The research conducted did not engage the other workers who had no management skills as they still affect the quality of products produced since they are the main workers in the factories. This study will therefore fill this gap and engage all staff within the organisations.

A value chain analysis for timber in four East African countries	Daniel Hulusjö (2013)	an exploratory case study	- time of processing forest products usually takes longer than expected -the forest cover is getting depleted in a very quicker manner	- The researcher focused mainly on the production and retailing of timber, and left the growth procedures of timber. This study will therefore focus on the growth and quality management of maintenance procedure for effective tree production
Changing Access to Forest Resources in Tanzania	Elizabeth .J. Z. Robinson and George C . Kajembe (2009)	Fieldwork survey in villages located near the Nguru South Mountains in Tanzania	Resources that have a highly inelastic demand and few substitutes, the displacement effect is likely to be large. For example, fuel wood will almost certainly continue to be extracted in similar volumes, either more intensively elsewhere or illegally within particular areas of the JFM forest.	The study did not take into consideration the importance of planning and control of both human and natural resources. This study will reflect the effectiveness of quality control and planning on improvement of forest products

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Research methodology is a systematic way of solving any research problems. The chapter present detailed research design, how to go about in getting target population, sampling procedure, sample size, research instruments, validity and reliability of research instruments and data analysis technique.

3.1 Research Design

Kothari (2006) says research design is the conceptual framework within which the research is conducted, or, the blue print. It ensures collection of relevant evidence with minimal expenditure of effort, time and money. Creswell (2009) calls it the plan or proposal to conduct research. The study adopted an exploratory approach using a descriptive survey design to investigate influence of TQM processes on improvements of forest products. Descriptive survey design are used in preliminary and exploratory studies (Luck and Reuben, 1992). To allow researchers gather information, summarize, present and interpret for the purpose of clarification. By involving a broad spectrum of respondents, the proposed study fits within this design.

3.2 Distribution of Respondents/ Target Population:

The target population refers to a group of individual or study subject which are similar in one or more ways and which forms the subject of the study in a particular study; the target population of the study was the entire set of units for which the data were used to make inferences. Establishing study objects is the first step in designing a survey. The study area has well established forest stations, each managed by a professional forest manager. The study therefore targeted 4 forest stations and 4 forest managers. The study targeted a total of 60 respondents which comprised of 12 respondents from Kipkabus, 16 respondents from Kaptagat, 15 respondents from Sabor forest station and 13 respondents from Penon.

Table 3.2 Distribution of Respondents/ Target Population:

Category	No of workers	No of station managers	Total.
Kipkabus	12	1	13
Kaptagat	16	1	17
Sabor	15	1	16
Pennon	13	1	14
Total	**56**	**4**	**60**

3.3.1 Sampling procedure

A sampling procedure defines the rules which specify how the system calculates the sample size and it contains information about the valuation of an inspection characteristic during results recording. It is a technique of selecting the part of population on which research can be conducted, which ensures that conclusion from the study can be generalized to the entire population. The researcher used census sampling techniques that allow him to use cases that have required information with respect to the objectives of the study. Cases of subjects are therefore handpicked because they are informative or they possess the required characteristics (Mugenda, 2003).

3.3.2 Sample size

The sample size was drawn from four forest stations within Keiyo South Sub County from the nationals 150 stations country wide. The sample was a representative of the national forest stations within the country. The sample size was a target of 60 respondents within the forest stations which included all the staff members in these four forest stations.

3.4 Data collection Methods

The researcher acquired a permit from the national council of science and Technology to conduct the research. The researcher obtained a written permission from the ecosystem conservator of Elgeyo Marakwet County: introducing him to the staff members who were interviewees. The researcher distributed questionnaires and collected them back immediately after being filled to ensure efficiency in data collection. The study employed the use of both questionnaires and secondary data collection which includes eyeballing. A questionnaire was the tool developed by

the researcher in a conjunction with the supervisors. This method of data collection is quite popular particular in case of big inquiries (Kothara, 2004). Closed ended questionnaire were used due to its easiness to administer and analyse. The questions were administered to the selected individuals in every category. The researcher work hand in hand with research assistants to deliver the questionnaires to each individual and collected them immediately after being filled.

3.5 Validity of Research Instruments

The quality of research study depends to a large extend on the accuracy of the data collection procedures. That is the instruments or tools used to collect the data must yield the type of data the researcher can use accurately to answer his/her questions (Mugenda and Mugenda, 2003). Validity is the accuracy and meaning-fullness to inferences which are based on the research results. In other words, validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. Validity answers the questions "are my findings true?" (Kerlinger, 1973). The researcher consulted with his supervisors and the other experts to make sure that collected data were valid. A pilot study also ensured validity of instruments.

3.6 Pilot Study

According to Alan and Emma (2011), the research instruments that one applies in their study affect the final outcome of the study. In order to check for validity of the research questionnaires used, the researcher did a pilot study of the instruments to get opinions and suggestions through focus group discussions and interactive sessions in interviews. During the pilot study the questionnaires were administered to 12 respondents from Cheususu forest station in Koibatek Sub County Baringo County. 1 forest manager and 11 staff were involved in the pilot study. The respondents who participated in the study were not to take part in the actual study as this was done purposely for testing reliability of the research instruments.

Secondary data means data that are already available i.e. they refer to data which have already been collected and analysed by someone else. The researcher relied on monthly, quarterly and annual reports of forest managers regarding forest activities which enhances total quality management (TQM) for the last five years. The activities were specifically planting, pruning, thinning and re-spacing.

3.7 The reliability of research instruments

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 2003). There were three types of random errors that arise at the time of data collection. These were errors due to the inaccuracy of instrument, the inaccuracy of scoring by the researcher and unexplained error. These errors combine to produce a consistency in the measurements, which ultimately affect the reliability of the data collected. In assessing reliability of the data collected, the researcher will use test-retest method to obtain correlation coefficient which is known as Cronbachs Alpha coefficient of reliability. A coefficient of 0.8 or more implies that there is a high degree of reliability of data.

3.8 Data analysis techniques

The data collected were analysed through descriptive statistics and presented through tables, pie-charts, graphs and frequencies. Measures of central tendencies and dispersion were used where applicable. The researcher used Correlation analysis techniques to measure relationships and the effects of independent on the dependent variables (Polonsky and Waller, 2005). In order to generate emerging trends in the data, statistical package for social sciences (SPSS) will come into play.

3.9 Ethical considerations.

A letter was written to seek for permission to carry out research in the four forest stations. The researcher explained to the respondents that the information given by them was to be treated confidentially and only used for this study. Consent to undertake the research was first sorted from all heads of departments concerned before interviewing their staff. All respondents were briefed on the objectives of the research and participation will, be out of their own volition. In cases of any damages that came about due to interaction from the research and his team the researcher committed and ready to pay for any costs that the respondents will incur during the study.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION, DISCUSSIONS AND PRESENTATION

4.0 Introduction

This chapter presents the data analysis, presentation, interpretation of the data collected in the study and discussion of the findings. Findings are presented based on the objectives that the study sought to achieve on the influence of total quality management processes on improvements of forest products. A case of Keiyo South Sub-County, Kenya

4.1 Response Rate

A sample of 60 respondents was selected from four key forest stations in Keiyo South Sub-County. Table 4.1.1 show the distribution of the response rate within the four stations.

Table 4.1.1 : Showing response rate

Respondents	Sample	Response rate	Percent
Kipkabus	13	13	100.0%
Kaptagat	17	17	100.0%
Sabor	16	16	100.0%
Pennon	14	14	100.0%
Total	60	60	100.0%

The findings indicate that the researcher was able to obtain 100% response rate from the field study. From a total of 60 questionnaires that were given out, (13 to Kipkabus Station, 17 to Kaptagat Station, 16 at Sabor Station and 14 at Pennon Station) all the questionnaire were returned filled. The return yielded a response rate of 100%. This was due to the sampling procedure used which was census sampling method since the target population was a small sample size thus including all staff members in the study was the best option of collecting data. The researcher also had four assistants at each forest station who camped at the station till all questionnaires were dully filled and returned. This response rate was considered reliable for drawing conclusions from since the target population was achieved.

4.2 Respondents Demographic Background

This section presents the demographic characteristics of respondents with respect to their, age bracket, gender, working experience and education background.

4.2.1 Gender Distribution

Gender distribution is one of the effective ways of managing resources and activities in various firms as the company gets input from all sides and effectively manages its proceedings. The researcher therefore asked the respondents to indicate their gender and the findings were presented in table 4.21

Table 4.2.1: showing gender distribution in the four forest stations

Category	Frequency	Percent
Male	56	93.33
Female	4	6.67
Total	**60**	**100.0**

The findings show that the forest stations were mainly dominated by male gender. The researcher found it significant to establish the forest stations had 93.33% male with 6.67% female response rate. This reflects the rate of interest and employment as mostly only male counterparts are interested in the forest service and few ladies take the task of working in the forest stations.

4.2.2 Age distribution

One of the key ingredients to an organisations strength and growth is having the right people in the right place at the right time (Nzuve, 2010). Nzuve asserts that human resource planning is concerned with forecasting future human resources needs under changing conditions. Age is distribution is a key factor in organising workers in the work stations as peers work faster and understand each other quicker. The study saw it fit to seek and classify the respondents according to their age bracket. The options allocated were 18-20 years, 21-25 years, 26-30 years and 30 years and above. Table 4.22 reflects the finding of the age distribution.

Table 4.2.2: showing age distribution at the four forest stations

Category	Frequency	Percent
18-20 years	0	0
21-25 years	0	0
26-30 years	8	11.9
Greater than 30 years	50	84.7
No Response	2	3.4
Total	**60**	**100.0**

The findings show that employees at the age bracket of 30 years and above were represented with 84.7% of the staff. This was followed with and age bracket of 26-30 years with 11.9%, 3.4% of the respondents did not respond to this question. There was no employee in the age group between 18-20 years and 21-25 years. Age reflects the experience that one has undergone through in various parts of work and life in general. The age difference also makes it easier for the workers to interact and work with each other with minimal intergeneration gap between them. Team work and training between staff members becomes easier when the language of communication and understanding between the age gap is minimal. The age group was therefore sought to be elaborate for the study. The findings also reflect that there will be no replacement of the ageing workers and thus jeopardizing the organisations future strengths and growth.

4.2.3 Period of work

Expertise and experience is obtained through work period which is basically the number of years that a person has worked in a particular firm. The respondents were therefore asked to indicate how long they have worked with the Forest Stations. The period that one has worked in a particular field of specialisation does indicate the experience and proficiency level in that field of expertise. Table 4.23 give details of the period of work with their frequency and percentage distribution.

Table 4.2.3: showing work period

Working Period	Frequency	Percent
1-5 years	7	11.9
6 - 10 years	18	28.8
11 - 15 years	24	40.7
15 yrs and above	6	10.2
No Response	5	8.5
Total	**60**	**100.0**

The Findings reflect that most of the employees (24) had worked in the organisation for a period of 11-15 years represented with 40.7% of the respondents, eighteen (18) of the respondents had worked for a period between 6-10 years represented by 28.8%, seven (7) had worked for a period not greater than 5 years represented by 11.9% while 10.2% represented six (6) staffs who had worked for more than 15 year. 8.5% did not respond. This reflected that at least a larger percentage 40.7 had an experience of 1 decade in the forest service. The study findings were deemed accurate to draw concussions from and findings since the experience level and knowledge of quality management on various issues must have been covered in the various years of experience that the staff had undergone

4.2.4 Level of Education

The study sought to find out the highest level of academic qualification that the staff within these forest stations had attained. The researcher therefore requested the respondents to indicate their highest level of education. Table 4.24 reflects the finding of the highest education level attained by the staff members of the four forest stations.

Table 4.2.4: showing education level of the staff

Level of Education	Frequency	Percent
Primary	8	13.33
O-Level	37	61.67
Certificate	5	8.33
Diploma	8	13.33
Degree	2	3.33
Masters	0	0
PhD	0	0
Total	**60**	**100.0**

Findings indicate that most of the forest staff (37) had gone through O-level education with a representation of 61.67%, sixteen (16) had reached a level of primary and diploma each represented 8 staff members in the two levels of education respectively. This gave a percentage of 13.33 for each of the two groups that had reached primary and diploma level of education. Five (5) staff of the forest stations had reached certificate level in their area of education represented with 8.33% of the population. Only two (2) respondents had attained a degree in their field of study represented with 3.33% of the total population studied. There was no staff that had attained a master or Phd level of education from all the four stations. Different level of education attained is evident due to the fact of age difference and different education system that they had undergone through. The level of understanding management and application of skills could be affected by the education level one has attained. This is a factor considered as staff training and education is key in improvement of forest products.

4.3 Influence of planning and improvement of forest products

Well defined priorities and objectives is usually the key to success or failure of planning within organisations. Oakland (2006) states that implementing Total Quality Management is based on the plans that the manager places into action on their daily routines. The researcher therefore sought to find out if planning was being practised in the four forest stations.

4.3.1 Planning and improvement of forest products

Plantation procedures and other management procedures require effective planning and monitoring of the resources used. The study sought to find if the management plans and plantations procedures are being practised and if they are placed accordingly to the ISO standardisation procedures. The staff were to select an option that they felt best described the implementation of plans within the institution. The options given were Strongly Disagree, Disagree, and Unknown, Partly agree and strongly agree. Table 4.31 shows the findings of plantation and management plans with regards to the four forest stations

Table 4.3.1: Plantation and management plans

Category	Frequency	Percent
Strongly Disagree	1	1.7
Disagree	3	5.0
Unknown	1	1.7
Partly Agree	16	26.7
Strongly Agree	39	65.0
Total	**60**	**100.0**

The findings indicate that thirty nine (39) staff responded by 65.0% strongly agree that the plans were being practised in a manner that was preferred. Sixteen (16) of the respondents partly agreed that the plans were in action presented by 26.7% of the total respondents. 5.0% of the respondents disagreed that the plans were effectively in place with a response of 3 respondents. Only one (1) respondent did not know if the plans were effective and only one respondent strongly disagreed that the plans were actually in place each represented with 1.7 %. The findings reflect that planning is being practised effectively in all the four stations.

4.3.2 Relationship between planning and improvement of forest products

The study sought to find out the relationship between planning and improvement of forest products. Strategic planning is the planning of all the activities of a business to ensure competitive advantage and profitability (Encarta Dictionary 2009). Planning is key in all cycles of management as good planning makes good directions of doing work within the organisations. All the four forest stations managers recorded to be having planning processes in advance that help them in maintenance of the forest products that they manage. Table 4.32 indicates the correlation analysis between planning and improvement of forest products.

Table 4.3.2: correlation table showing the relationship between planning and improvement of forest products

Correlations			
		Planning	**Improvement of forest products**
Planning	Pearson Correlation	1	.993
	Sig. (2-tailed)		.000
	N	60	60
Improvement of forest products	Pearson Correlation	.993	1
	Sig. (2-tailed)	.000	
	N	60	60

The findings reflects that the data processed through correlation analysis to find the relationship between planning and improvement of forest products showed there was high positive relationship between planning and improvement of forest products. This was done at 95% confidence level and a significant relationship of p = 0.993 and r= 0.000. This depicted an indication that planning has been done well in the forest stations and we expected to see good forest products from the various stations in Keiyo sub county. This therefore meant that there was a significant relationship between planning and improvement of forest product. From the data on planning and improvement of forest product, it is factual that good planning procedures do actually affect the improvement of forest products. The main planning procedures as backed up by the four forest stations included seed procurement, planting, pruning and thinning of trees within the forest stations. This ensures trees to grow in a manner that makes them healthy and strong thus having good raw materials for the products they produce. This was seen as the staff members would follow orders and instructions as indicated in their duty schedules in order to achieve their mission and vision.

4.4 Role of control processes and improvement of forest products

According to Tulgan (2011), control is one of the three factors that should guide reward and incentives in the work place of the future. When control is practised in preferred ways resources are utilised effectively and thus minimising wastage of resources at the workplace. The study sought to find out if control was in place in the four forest station.

4.4.1 Control and improvement of forest products

According to Gretton (1995), control is required by employees for feedback about task performance, how performance will be measured and where reward systems are based on performance. The researcher sought to find out if control was practised on the types of seedlings that the forest stations plant, if monitoring and evaluation was done and if there was specific rules in place stipulated for pruning, weeding and thinning of trees in the forest stations. Table 4.41 show the findings.

Table 4.4.1: practise of control

Category	Frequency	Percent
Certified Seed Used	15	25.00
M&E practiced Frequently	11	18.33
Rules for Pruning in place	12	20.00
Rules for Weeding in place	12	20.00
Rules for Thinning in place	10	16.67
Total	**60**	**100.0**

The findings of the study reflect that fifteen (15) of the staff responded to effective use of certified seed being used in the forest station represented with a percentage of 25% of the respondents. Twelve (12) of the respondents recorded to control being practised on pruning and wedding represented with a percentage of 20%. Eleven (11)of the respondents were recorded to have noted that effective monitoring and evaluation is being controlled by the management represented with 18.33% of the total sample population and ten (10) staff responded to practice in control with regards to thinning of trees during plantation. They were represented with 16.67% of the total population sampled. From the data findings it is evident that control was in practise in the four forest stations as it was evenly distributed among the response from the staff.

4.4.2 Relationship between Control and Improvement of forest products

Utilisation of resources demands that control to be practised in order to achieve the objectives of an organisation effectively. The study sought to find out the level of relationship between control and improvement of forest products. In order to improve the forest products timber as Tulgan (2011) had reported, control is one of the three factors guide's staff in a work place.

The result showed there was a significant relationship between the control and improvement of forest products, thus the performance of staff and guidelines with relation to control and improvement of forest products are rewarding. The relationship was slightly positive and thus more forest products are expected to improve when more control is kept in place. Table 4.42 shows the findings of the study with relation to control and improvement of forest products.

Table 4.4.2: correlation table showing the relationship between control process and improvement of forest products

Correlations			
		Control Process	**Improvement of forest products**
Control Process	Spearman's Correlation	1	.544
	Sig. (2-tailed)		.000
	N	60	60
Improvement of forest products	Spearman's Correlation	.544	1
	Sig. (2-tailed)	.000	
	N	60	60

The finding reflects that at 95% confidence level, there was a significant relationship between the control process in place and the improvement of forest products. This was so since p = 0.544 and r = 0.00 giving us a positive correlation. Shirley et al. (2005) indicates that for a weak correlation, "r" ranges from + 0.10 to + 0.29. The significance of the correlation was not that strong since the value of p is greater than 0.5 with a minimal value of 0.044. This suggests that if control process is practised in actual order the effect will be seen from the products produced at the end of the processing of forest product. The analysis was done at a significant level of 0.01

4.5 Role Staff training and improvement of forest products

Training for quality management requires development of specific skills sets that support quality management practice (Dertouzos, Lester and Solow, 1992). The researcher therefore sought to find the training practises in the four forest stations.

4.5.1 staff training and improvement of forest products

Becker (1964) states that training is an important investment into human capital, and thereby helps to increase the future earnings. The researcher therefore sought to find out if staff training is effective to the required level so as to enable the staff achieve their goals at work. Table 4.51 shows the staff training practices and their distribution in the four forest stations

Table 4.5.1 Training practises in the forest stations

Training element	Frequency	Percent
Seminars	32	53.33
Coaching	10	16.67
Training policy	18	30.00
Total	**60**	**100.0**

The findings reflect that thirty two (32) staff responded to be partaking place in seminars with a presentation of 53.33%, eighteen (18) of the staff responded to noticing the presence of training policy in the station represented with 30.00% of the total sample. Ten (10) of the respondents recorded to have said that presence of staff coaching is practised in the institution, this presented 16.67% of the total sample. From the findings it was evident that training was in place and staffs were encouraged to take place in the various trainings available.

4.5.2 relationship between training and improvement of forest products

Staff training is one of the major pillars in development of human resources in all industries of the economy. The study investigated the staff training practices within the four forest stations and table 4.52 shows the finding of the relationship between staff training and improvement of forest products.

Table 4.5.2: showing correlation table showing the relationship between staff training and improvement of forest products

Correlations			
		Staff training	**Improvement of forest products**
Staff training	Spearman's Correlation	1	.075
	Sig. (2-tailed)		.572
	N	60	60
Improvement of forest products	Spearman's Correlation	.075	1
	Sig. (2-tailed)	.572	
	N	60	60

The findings indicated that at 95% level of significance there was no significant relationship between staff straining and Improvement of forest products. This is because the value of p = 0.075 is very small compare to 0.5 level of significance. The value of r = 0.572 however indicates that staff motivation does influence improvement of forest products. This is because it is greater than 0.05. This implies that staff training needs to be conducted at a frequent basis and it should aim at improving the skills of the staff with regards to improvement of forest products. The table 10 indicates that the four forest stations are not keen with training of staff members in order to improve their skills and tasks that they undertake in the stations. 41.7% disagreed that there was no adequate plans in the forest stations that sought to improve there studies in their various areas of profession. An average of 20% agreed of the schemes in place to improvement of training for staff and workers within these stations. Table 4.53 give detailed information on the distribution of response with regards to staff training and improvement of forest products.

Table 4.5.3: opportunities to improve education and training to commensurate task

Category	**Frequency**	**Percent**
Strongly Disagree	5	8.3
Disagree	25	41.7
Unknown	2	3.3
Partly Agree	15	25.0
Strongly Agree	12	20.0
No Response	1	1.7
Total	**60**	**100.0**

The findings also indicated that the four forest station engage in needs assessments for the staff training annually. This would affect the response rate since only few of the staff involved would be undertaken for staff training and improvement thus making a larger percentage 41.7% to disagree that staff training takes place in the forest stations.

4.6 Role of Staff motivation and improvement of forest products

Attention must be given to removing barriers to motivation and to a greater recognition of the human element including the resistance to, and fear of change (Reis, D. and Pena, L. 2001). Staff motivation can be practised in various ways in order to improve the effectiveness of the staff members in the work they do. The study therefore sorts to fin out how staff motivation affects improvement of forest products.

4.6.1 Staff motivation and improvement of forest products

According to Redman (1995), proper attention to human resource issues is an essential requirement for the successful implementation of the total quality management, these includes staff motivation and training. The researcher therefore sought to find out how staff motivation is practised in the four stations and came up with the following data. Table 4.61 shows the findings of staff motivation within these four forest stations.

Table 4.6.1: staff motivation

Motivation elements	Frequency	Percent
Rewards are fairly done	9	15.00
Decent houses for staffs	11	18.33
Well paid in accordance to work	25	41.67
Staff involved in decision making	15	25.00
Total	**60**	**100.0**

The findings show that twenty five (25) of the staffs agreed to that the station did pay its workers accordingly to the work that they did. This was presented with 38.33% of the total population sample. Fifteen (15) of the respondents noted that the staff are usually involved in the decision making process in a fair and equitable manner, this was presented by 21.67% of the sample size. Eleven (11) of the respondents said that they do get decent housing within the forest station area,

this was presented by 15.00% of the sample size. Nine (9) of the respondents said that the forest station did reward the staff according to the work that they had done in the station. This was presented with 15.00% of the total sample. From the findings it is evident that staff motivation is not well carted for in the essence it is supposed to be, the researcher therefore found it fit to find out the relationship between staff motivation and improvement of forest product through a correlation analysis

4.6.2 Relationship between motivation and improvement of forest products

Staff motivation affects the effectiveness of workers and growth of any organisation. The relationship analysis between staff motivation at four forest stations within Keiyo north Sub County reflects that there is no significant relationship between staff motivation and improvement of forest products. Table 4.62 reflects the findings on the relationship between staff motivation and improvement of forest products.

Table 4.6.2: correlation table showing the relationship between staff motivation and improvement of forest products

Correlations			
		Staff Motivation	**Improvement of forest products**
Staff Motivation	Spearman's Correlation	1	.181
	Sig. (2-tailed)		.170
	N	60	60
Improvement of forest products	Spearman's Correlation	.181	1
	Sig. (2-tailed)	.170	
	N	60	60

The findings show that the value of p=0.181 indicates a positive relationship but not a significant relationship. This therefore shows that in order to improve the forest products staff should be motivated well within these forest stations and they will work according to their vision and mission thus improving the quality of forest product.

The findings also reflected that there is a performance appraisal and contract system in place within all the four stations. Staff were not rewarded despite the quality work they undertake to

work according to the performance contract. All the four forest station managers reported that the reward system was not practised in the four forest stations.

For instance the forest station manager from pennon was recorded saying that:

The reward system is available but yet to be implemented.

His counterpart from kaptagat said:

Reward system is clearly shown in performance appraisal forms but yet to bear fruits

This clearly indicates that the motivation of staff is never done within the forest stations despite them being ISO certified.

4.7 Quality Management and Improvement of forest products

The study sought to find out if the four forest stations did practise quality management and the extent of practise of quality services. Table 12 reflects the findings with regards to quality.

Table 4.7: ISO certification of the forest stations

Forest station	ISO Certification
Kipkabus	Yes
Kaptagat	Yes
Sabor	Yes
Pennon	Yes

All the four forest stations follow the forest service ISO standardisation procedures i.e (ISO 9001:2008). This means that the procedures followed in ensuring services to clients and staff are to the international standards. This therefore shows that monitoring and evaluation is in place to comply with the setting policies and guidelines to ensure utilisation of resources is effective and forest products produced are of high quality and standards.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions and recommendations of the study. These are derived from the findings of the study. The summary, conclusions and recommendations are presented based on the findings of the objectives that the study sought to achieve. The conclusions are drawn from the analysis and presentation section and presented according to the objectives that they sought to answer

5.2 Summary

This study was aimed at seeing the influence of total quality management and how it affects the improvement of forest products. The study found that the four forest stations had 88% male with 1.7% female. This would be due to customs and beliefs of various African traditions that would make male gender prefer the job than female gender. Activities like climbing and pruning trees, arresting suspects inside the thick forest was though to be a male role thus having a greater number of employees being male in the forest stations. Most of those who were employed in these forest stations were above 30 years of age; this would be due to the young generation of Kenyan youths who prefer other professions. Structural adjustment program which was a creation of the International Monetary Fund and the World Bank led to freezing of employment 20 years ago thus the age gap difference leading to fewer youths being employed in the current stations. 40.7% of the employees had worked in the forest station for over 10 year, thus they would have more experience and expertise in the fields of forest products and how to handle these products. This shows that the sample chosen from the population gave relevant detailed as to how forest products are managed and produced from the forest.

All staff members had undergone basic education of primary school and 49.2% of them had undertaken their O-level studies. This implies that they did understood what forest products are and partaking part in the study was effective since they gave relevant data that was meaningful. The education level attained also indicates that they do understand instructions and manuals to be done as most of these come in international language and the staff were able to read and answer most of the questions from the questionnaires.

Planning and improvement of forest products

The study showed that staff responded by 65.0% strongly agreeing that the plans was being practised in a manner that was preferred. This is positive feedback since effective planning affects the actual management process and the products also improve. Planning influences the improvement of forest product in various ways; well laid procedures to be followed are easy to be understood and to be enacted upon. From the study, planning was effective since Pearson's correlation found a highly positive correlation with a value of $p = 0.993$ which indicates that as planning is improved so does the forest products. This indicates that in order to improve forest products planning should be part of the effective strategies to enact and embrace improvement of forest products. Only 1.7 % did not know if the plans were effective and strongly disagreed that the plans were actually in place.

Control and improvement of forest products

The control process is also important in improvement of forest products. The study reflected that 25% of the staff responded that their was effective use of certified seed. The results from the four forest stations indicates that the staff within these stations do actual practice control, this is so since the value of $p = 0.544$ is a positive relationship thus showing that as control improve so does the forest products. This means that control is in practise but not to the preferred level since it is a slightly positive value. Therefore more needs to be done on the control of resources and human labour within the four forest stations so as to effectively achieve the needs and requirements that the four forest stations had set.

Staff training and improvement of forest products

The study found that 53.33% of the staff do partake seminars to improve their skills and understanding of various processes in the forest station. This however needs to include other forms of trainings not only seminars; they can involve workshops, short term courses and many more. When staff and other personnel are trained, they become confident of what they are actually doing in the firm and other projects. The relationship between staff training and improvement of forest products is minimal in Keiyo Sub County. This may be as a result of the staff attending training that are more concerned with wild life animal instead of the forest product, for instance protection of indigenous animals such as the elephant and white rhino in the forest and game reserves. This therefore implies that the staff should be trained more on the various methods and means of improving the forest products so as to have quality forest products.

Staff motivation and improvement of forest products

Staff motivation is a very important aspect in any organisation. The study found out that twenty 38.33% of the staffs agreed to that the station did pay its workers accordingly to the work that they did. This lowers the staff morale in working and start having rebellious behaviour at the work place. From the results obtained, staff motivation in the four stations is lacking thus no significant relationship between staff motivation and the improvement of forest product. The value of $p=0.181$ being a low positive relationship thus improvements need to be made in the staff motivation in order to improve the products they produce.

5.3 Conclusion

The study found that forest service is a male dominated occupation and more females need to be encouraged to take various courses that pertain to the forest service. The findings also reflect that in all the four forest stations cypress tress enjoyed a larger pool of the forest area covering larger than 30% of the forest cover compared to other species such as Eucalyptus and pine. The study also found that planning and control are in practice within Keiyo Sub County, this has been the main factor of consideration for improvement of forest products such as timber, the forest service needs to be more vigilant and include other factors such as staff training and motivation in order to improve the forest products and have better quality in the market.

Strategic plan is the company's plan for how it will match its internal opportunities and threats in order to maintain a competitive advantage (Dessler, 2011). It is the duty of the manager to formulate specific strategies to take the company from where it is now to where he or she wants it to be. The four forest station managers reported that there exists a strategic plan for the managers of all forest station in Kenya. This was majorly to produce universal quality of forest products which will wade off competition form other products. The documents exhibited in this category of plans were mission and vision statement and organisation management plans. .

Any long term plan will attempt to forecast over five years ahead (Nzuve, 2010). All the four stations had in their possession plantation management plans, compartment registers and seed indent book. The responsibility of short term planning lies with respective supervision (managers). Short term plans are supposed to facilitate the accomplishment of long-term plans. Three forest stations out of four had calendar of events which specified operations to be undertaken during the year in question. All the four stations had annual work plans (AWP). All those plans were necessary for the accomplishment of the organisations objectives

Every organisation has control systems that coordinate the exercise of decision rights that are dispersed among individuals. Control systems also measures how effective decisions have been translated into results. It is about influencing the behaviours of individuals in the interest of the corporation (Zimmerman 1997). All the four forest stations had their disposal a range of monitoring and evaluation document which ranged from master rolls, monthly progress reports, performance contract documents, annual performance appraisal report, technical orders and staff

rules and regulations. According to Zimmerman, an organisation without control is impossible. A major international report undertaken by proudfoot consulting found that poor management in terms of inadequate planning and control and insufficient day to day supervision of work is still the longest single reason for loss of productivity (Proud foot consulting, 2002). It is now the responsibility of the forest manager to strictly supervise all forest activities; either personally or through delegation for efficient and effective production of desired goods and services.

5.4 Recommendation

In line with the results and conclusions arrived at the researcher had the following recommendations.

On the influence of planning on the improvement of forest products, the management must involve all employees of all cadres in planning processes. Input and feedback of planning should always follow down up approach.

The Kenya Forest Services have excellent plans to turn around forest industry and create more jobs for Kenyan populations. I hereby implore all Kenya Forest Service personnel to do everything possible in order to implement these good plans to benefit this generation and prosperity. On the role of control on improvement forest products; the Kenya Forest Service are advised to use Kaizen concept in all Silvicultural activities. Kaizen is a Japanese word for the philosophy that defines management's role in continuously encouraging and implementing small improvements involving everyone (Besterfield etal, 2012). It is simply maintenance and continuous improvement of existing plantations.

Lack of adequate supervision and control or of an effective risk management system, are major features of poor organisational performance and can even lead to the collapse of a company (Tiballs, 1999). It is therefore imperative for all KFS personnel at all levels to highlight supervision of staff and embrace monitoring and evaluation of forest operations as frequent as possible. The success of the Kenya Forest Service business is squarely hinged on this single function of management (control). You don't motivate individuals. You provide them with an environment to be self motivated. It is a personal decision, but it is management's job to provide the right environment (Mullins, 2010).

More needs to be done on control of production and maintenance of various activities with regards to improvement of forest.

One major area of the human resource functions of a particular relevance to the effective management and use of people as training and development (Mullins, 2010). Skills shortage is often the result of short terms and little or no analysis of present of future training needs. Keeping skilled workers is one of the first business goals. Each employee must be oriented to the organisations philosophy of commitment to never ending improvements. Therefore the top management must allocate resources to train employees to perform their jobs in the best manner possible. The organisation must be serious on the implementation of training needs assessment reports which it receives each year for every employee. Organisations quality statement which is conspicuously hanged in all KFS offices should be religiously followed in order to achieve desired goals. There is an urgent need for Kenya Forest Service management to urgently appraise its training and development policy on their staffs in order to align it to the training needs of its workforce Staff training should be done on a regular basis for instance twice in a year so as to allow staff grasp the concepts of quality and improvement of forest products, and participation of all the staff members to avoid misunderstanding in the stations.

Motivation is complex and there is no ready made solution pr single answer to what motivates people and work well. The management of Kenya forest service may therefore come up with various motivational models and theories for the sole purpose of providing the right environment for its work force to do better job. Decent houses of staff within work stations and improvement welfare facilities like disappearances are encouraged. Staff at all levels should be involved on decision making of all organisations undertaking if they are to own them. Staff motivation should be done in various ways so as to encourage the staff in active work, for instance awards should be given in monthly basis with regards to performance in their duties and various departments will improve.

5.5 Suggestions for Future Research

Based on the study undertaken the following recommendations are hereby made for further studies.

Since the study was done in Keiyo South Sub County, it should also be replicated in other regions of the country.

There is dire need to undertake comprehensive monitoring and evaluation in all plantation treatments to ascertain whether continuous improvement processes inline with Total Quality Management are being undertaken.

A similar study can be conducted in Kenya Wild life service on other products such as the management of wild life and other forest products interaction.

A research can also be conducted to determine the influence of staff training and motivation of staff on quality improvement of forest products and services.

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APPENDICES

APPENDIX I: TRANSMITTAL LETTER

JOHN C. KIDOGO,

P.O BOX 397,

ITEN.

Dear respondent,

You are kindly requested to fill the questionnaire below with sincerity and honest. The information given will be treated with confidentiality and your name will not appear anywhere in the study.

Kindly answer the questions below by either ticking and/or writing brief statements on the spaces provided

Yours sincerely

John C. Kidogo

L50/72940/2014

M.A. Project Planning and management student

University of Nairobi

APPENDICES II: QUESTIONNAIRE

QUESTIONNAIRE FOR KENYA FOREST SERVICE STAFF.

SECTION A: BACKGROUND INFORMATION				
1	Gender	Male Female	[ ] [ ]	Select the most appropriate
2	Age bracket	18-20 21-25 26-30 >30	[ ] [ ] [ ] [ ]	Select the most appropriate.
3	How long have you been in this organization?	…….... (months or years)		State the length of time taken so far.
4	Position held	Top level management Administrative staff Forester Support staff	[ ] [ ] [ ] [ ]	Select the most appropriate.
4	Highest academic level attained	Primary O-Level Certificate Diploma Degree Masters PhD Any other……	[ ] [ ] [ ] [ ] [ ] [ ] [ ]	Select one

SECTION B

Read these items carefully and indicate your choice to what you think is applicable to you by putting a tick **(**√**)**. The following numbers will stand for the following decision:

5- Strongly agree

4- Partly agree

3- Unknown

2- Disagree

1-Strongly disagree

1. To what extent to you agree with the following statements on the influence of planning on quality improvement of forest products

Statement	5	4	3	2	1
Planning for purchase of certified seeds are done in the station regularly.					
Weeding of tree plantations are well planned and executed regularly					
Pruning schedules have been put in place and implemented to the letter in all plantations in the station					
Pruning heights are observed for all tree species during pruning operations in the station.					
Thinning schedules plans are in place and adhered to in all plantations in the station.					

2. To what extent do you agree with the following statements on the control processes on quality improvement of forest products in your forest station.

Statement	5	4	3	2	1
There is a technical order stipulating the source of certified seeds in your organization.					
There is a specific rules stipulated for tree weeding in plantation stands					
There are specific rules stipulated for pruning schedules for different tree species in your station.					
There are rules stipulated for thinning schedules in your station.					
Monitoring and evaluation in all forest activities are frequently undertaken by your supervisors to ascertain whether they are done according o regulations					

3. To what extent do you agree with the following statements on influence of training on quality improvement of forest products

Statement	5	4	3	2	1
Your level of education and training is adequate for your job description					
Your organization has provided you with adequate opportunities to improve your education and training to commensurate with your tasks.					
Skills acquired through training and staff coaching in your organization has prepared you adequately for your job.					

4. To what extent do you agree with the following statements on influence of staff motivation on the quality improvement of forest products

Statement	5	4	3	2	1
All staff members of your station are well paid according to their job description.					
There is a well developed retirement scheme package for all staff members in the station.					
All workers in the forest station are in one way or the other involved in decision making in all the forest activities.					
Staff members of the station are rewarded promptly are fairly					
Meritocracy and professionalism are embraced in all promotion exercises in the station.					
There is a well established medical cover for all staff members in the station.					

APPENDIX III: INTERVIEW SCHEDULE FOR FOREST STATION MANAGER

1. Gender _____
2. Which tree species do you mainly plant for commercial purposes in your area and why?

   _____

   _____

   _____
3. What proportion do each tree species occupy in your forest area? _____

   _____

   _____

   _____
4. In what form or use are these trees to your customers? _____

   _____

   _____

   _____
5. What are the rotation age (maturity age) for each of these preferred species? _____

   _____

   _____

   _____
6. In your opinion do your organization employ any form of quality concept in production of forest products? _____

   _____

   _____

   _____
7. What characteristic of tree species do your customers prefer? _____

_____

_____

_____

8. Which processes do you employ to improve the quality of timber in your station_____

_____

_____

_____

9. Do you plan for these processes in advance? _____

_____

_____

_____

10. If yes to question 9 list down all the types of planning you engage in order to improve timber products_____

_____

_____

_____

11. Who are involved in planning processes in your station? _____

_____

_____

_____

12. Which tools do you use to monitor and evaluate activities to make sure you are on the right tract? _____

_____

_____

_____

13. Is your organization ISO Certified _____
14. If so briefly explain what your ISO Standard entails_____

    _____

    _____

    _____
15. Is your current salary and allowances commensurate with your responsibilities as forest station manager? _____

    _____

    _____

    _____

16. How often does your organization undertake training needs assessment of your staff members? _____
17. Does your organization have a scheme of service for all staff members? _____

    _____

    _____

18. Does your organization perform performance appraisal annually? Please briefly explain?

    _____

    _____

    _____

    _____

19. Is there reward system where good work is recognized and given due credit? _____

_____

_____

_____

20. Are training needs and room to further staff career available in your organization? Please explain? _____

_____

_____

_____

21. Is career progression done fairly in your organization? Please explain_____

_____

_____

_____

22. How does the following factors affect quality improvement of forest products (timber) in your station

a) Government policies

_____

_____

_____

b) Climate change phenomenon

_____

_____

_____

23. What are the obstacles to successful implementation of the total quality management process? (To list down)

_____

_____

_____

APPENDIX IV: Checklist for secondary data collection

1. **Planning tools**

a) Plantation management plans

b) Annual work plans

c) Calendar of events

d) Compartment register

e) Mission and vision statements

f) Organization strategic plans

g) Organizations core values

h) Seed indent book

1. **Control tools**

a) Muster rolls

b) Nursery records

c) Progress report documents

d) Monthly reports documents

e) Daily allocation of cost records

f) Appraisal reports documents monthly quarterly and yearly

g) Performance contract documents

h) Technical orders for implementation of forest activities

i) Staff rules and regulations

2. **Staff motivation**

a) Pay slips showing individual salaries and allowances

b) Medical insurance cover for staff documents

c) Scheme of service for all staff

d) Formation of welfare groups in the station

3. **Staff training**

a) Documents showing level of academic and professional levels of each staff members

b) Document showing training needs analysis for each staff member

c) Number of courses and seminars which staff members have undergone in the last 3 years

d) Number of interns, students field attachments for the last 3 years (staff coaching)

APPENDICES V: WORK PLAN

PROPOSAL WORK PLAN

2015				
	APRIL	**MAY**	**JUNE**	**JULY**
Topic selection				
Proposal writing				
1st correction				
Pilot and pre-testing of questionnaires				
1st defense				
Data collection				
Analysis				
Preparation of 1st draft				
2nd correction				
Final submission				
Final defense				

APPENDICES VI: BUDGET

BUDGET

ITEM	DETAILS	AMOUNT
Travelling	To all forest stations	15,000
Accommodation	10 night ×800	8,000
Printing and stationary	photocopy, printing Typing, scanning	6,000
Miscellaneous		4,000
TOTAL		**33,000**