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INFLUENCE OF TOTAL QUALITY MANAGEMENT ON PERFORMANCE OF TEA PROCESSING FACTORIES IN KERICHO HIGHLANDS, KENYA

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ABSTRACT

The purpose of conducting the study was to establish the influence of total quality management on performance of tea factories in Kericho Highlands. The study was guided by Quality Improvement theory. Descriptive survey research design was used in conducting the study. The study targeted 180 respondents working in 12 KTDA owned tea factories in Kericho highlands. Sampling units were factory unit managers, Finance managers, ICT managers, field services staffs and Production staffs. Stratified random sampling technique was used to select respondents from the sampling units to come up with a sample size of 124. Questionnaire was used as the main data collection instrument. Pre-testing of the research instrument was done in Chebut Tea Factory, KTDA owned tea factory in Nandi County using a sample size of 12 respondents. The study found out that total quality management positively and significantly influences the performance of tea factories in Kericho highlands. The study concluded that total quality management influences performance of tea factories in Kericho highlands. The study recommended implementation of total quality management practices by tea factories in Kericho highlands in order to improve their performances.

***Key Words**: KTDA, Total Quality Management, Performance, Tea Processing Factories*

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INTRODUCTION

Total quality management is the ability to produce products according to customer demands. Change in consumer taste and preferences, quality products, timely response to customer needs, business flexibility and overall cost reduction in production are some of the major benefits of total quality management (Jamali, Ebrahimi & Abbaszadee, 2010). Tea factories should forge long term relationships with lean suppliers who provide on reasonable prices and quality. The supply chain can be a deterrent or advantage to production operations. When the suppliers are incorporated by alliances, they can know the company needs and cooperate to the company achieving their objectives.

Performance is the ability of tea factories to meet their financial obligation in the market. Tea factories measure their performances in terms of cost reduction, flexibility, quality products and customer services (Hajinoor, 2012). According to Begam (2013), firm performance is largely dependent on key performance indicators. Cost saving on modes of distribution, efficient mode of assembling and maximum sales makes a firm efficient and effective in response to the demands of their customers. Production cost reduction, value addition to products towards achieving maximum customer satisfaction and high returns on investment clearly define tea factories performance. Traditionally, performance was viewed in terms of finance only but recent scholars have established non-cost measures that can be used to determine performance. They include market share, product quality, company image among others.

Globally, stiff competition amongst tea-processing factories has necessitated production in large scale using modern technologies. In Sweden, tea factories have adopted lean practices and innovative strategies in a bid to be competitive (Martin & Barth, 2018). This was with an aim of ensuring Lean production through elimination of unnecessary modes of transport, over stocking, ensuring equipment utilization, reduction in production delays, reduction of excessive production that leads to excess waste and ensure maximum utilization of labor. Production according to customer demand and desire to reduce production cost is the major challenge affecting performance of tea processing factories.

Tea processing factories in United States have achieved efficiency and effectiveness in supply chain using lean practices to an increase their performances through maximum sales (Plenert, 2010). The study elaborated on an initiative on supply chain known as summit with an intention of improving traditional procedures and processes of production. This was made possible through implementation of lean policies, use of quality tools and continuous improvement policies, demand management, collaboration, use of modern technologies in production. Tea production in Vietnam has experienced tremendous changes in terms of waste reduction using lean production tools (Ross, 2010). Among the tools is they had adopted is continuous improvement model that enable tea factories to successfully and effectively manage their production performances. Recent years has seen a shift in the nature of competition from the traditional practices used in the 80s. This has necessitated tea factories nowadays to compete against other tea factories based on the best service delivery and quality products to the customers (Gottorna 2010).

Quality tea production through implementation of lean manufacturing practices like total quality management has enabled tea factories in India become excellent competitors (Venkateshwarlu, Ashish & Manoj, 2011). Adoption of lean and six sigma practices enables firms to reduce waste and defects respectively. To improve their production performances, tea factories should therefore adopt lean practices that seek to eliminate wastes and six-

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sigma practices which aims at reducing defects in production process rather than inspection. Adoption of pro model helps tea factories mitigate quality management challenges. Production of quality tea by tea factories involves monitoring quality in all production stages. It is therefore necessary for tea factories to install quality management systems.

Tea factories in Ethiopia attribute their improved performance to integration with other tea factories and the overall nature of the market environment (Mulugeta, Adrienn & Xavier, 2016). Fragmentation in tea processing supply chain is due to insufficient supply chain principles, self-interest of partners, mismanaged Tea cooperative societies, inadequate information sharing to farmers and lack proper regulatory framework on factories. To improve their production performances, tea factories should ensure standardization of methods and performance measurements. In addition, there is need for tea processing factories to integrate value chain performance adoption of lean practices that aims at reducing cost and waste during production.

In Uganda, Unlike Kenya, Ugandan tea processing facilities are either unevenly distributed, or are concentrated in one area with many of the potential tea growing areas having no processing facilities (Munyambonera, 2014). Tea factories are facing challenges of excess waste due to poor infrastructure and poor tea handling during delivery to the respective tea factories. In addition, infrastructural constraints turn Ugandan smallholder farmers into price takers. This is mainly because much of the smallholder tea output is marketed through the large tea estates and factory owners. Tea discovery traces back to over 5000 years by Emperor Shen Nung in China. GWL Caine was the first to introduce Tea in Kenya in 1903 which was planted in Limuru region (Tea Board of Kenya, 2010). Recent years has seen Kenya ranked third behind china and Sri Lanka exporting over 1.4 billion kilograms of tea representing 18.2% (Trade map, 2018). Most challenges facing tea industry are due to high production costs due to high power rates, high labor costs, high cost of raw materials and inputs like fertilizers, machinery, packaging materials and poor infrastructure in tea production. High production costs, fluctuating tea prices, and increased competition from other tea growing countries are the main causes of restructuring process in the tea industry. Most challenges faced by tea processing factors are also attributed to lack of supply chain partnership with suppliers, lack of training of employees to improve their productivity, lack of continuous improvement systems and failure to observe total quality management in all production stages.

Major challenge facing tea-processing factories in Kenya is the high cost of production (Towett 2012). Tea factories in Kenya spend more in purchasing firewood and energy consumption during tea processing. This result in excess waste due to the inability to identify and eliminate ineffective processes in tea production. Wastage starts from tea collection from farmers by the clerks of the tea factories all the way to the factory for processing. Tea factories increase their tea prices to meet their costs which in turn lead to customers shifting to lower prices. This affects the performances of tea factories in the long run because they will face stiff competition from other tea factories who sell at cheaper prices.

According to KTDA report (2019), Kericho highlands is among largest volume tea producing regions in Kenya which produced over 77,000 metric tons per year. It traverses through Kericho and Bomet counties served by only twelve tea processing factories and they include; Chelal, Kapkatet, Kapkoros, Kapset, Kobel, Litein, Mogogosiek, Momul, Rorok, Tegat, Tirgaga and Toror. Wider geographical area coverage with only 12 factories attributes to wastage challenges due to

delays in delivery of tea to the respective tea factories coated with poor infrastructure in some parts of the region.

Kericho Highlands lies to the west of one of the Kenya's most crucial water towers of Mau forest complex. Small scale tea farms owned by farmers give rise to the awe inspiring green lush that is a site to behold. Most tea catchment areas in the region lie on the west side of the Mau forest that extends to join the Kisii highlands further west. This catchment experiences a dual type of rainfall received throughout the year, it is ensconced between the mau forest and lake Victoria which is less than 100 km to the west. Poor infrastructure which leads to delay in green leaf delivery to the tea factories. This is because of the bad weather roads in some parts of the region. Delay causes wilthing and quality degradation of the plucked tea.

Kericho highlands tea grows at 1500-2150 meters above sea level. The multihued nature of the taste of Kericho tea might be explained by the varied soil types which consist of well drained, shallow to extremely deep volcanic types. These factors combine to bring out the easy going vibrancy of Kericho highland teas. The tea possess unique characteristics, having a golden reddish tinge and a two range taste appeal combining medium pungency with mellow aroma and the other featuring full scent with a mild flavor, this teas offer a unique burst of experience with every sip. Tea factories can either be classified as lean or non-lean. Performances of tea factories vary leans firms performing better than non-lean tea factories. The study was conducted with an aim of establishing the existing relationship between lean procurement practices and performance of tea factories in Kericho.

Statement of the Problem

Total quality management is important for improving performances of tea factories. It enables tea factories to reduce excess waste during production, cost reduction, inventory management among others. However, tea factories are facing performance challenges due to high demand for quality tea. This has also been the cause of high prices of tea globally. Consequently, tea factories have resolved to increase their production capacities which in turn lead to increase in excess waste and high cost. High cost of production, poor infrastructure, excess waste during collection and delivery of green leaves from farmers are some of the challenges facing tea production in Kenya (Ratemo, 2010). Several studies have been undertaken on lean procurement practices and performance of tea factories. Perera and Perera, (2013) conducted a study in Sri Lanka to establish the challenges faced by tea processing factories. The study found out that tea factories paid little attention lean practices. This in turn lead to loss of customers and therefore poor performance. Jung, Jae and Jiyoung (2015) conducted a study in China on the role of social and economic satisfactions influence the relationship and the long-term partnerships of tea factories. Findings of the study showed that there has been growing emphasis by tea factories on the importance of strategic, durable, successful relationships between retailers and suppliers. Most studies on lean practices and performance of tea factories were not done in Africa particularly Kenya. Therefore, this study aimed at establishing the influence of total quality management on performance of tea factories in Kericho highlands, Kenya.

Study Objective

The objective of study was to establish the influence of total quality management on performance of tea processing factories in Kericho highlands, Kenya.

Research Hypotheses

Ho_1: Total quality management has no significant influence on performance of tea processing factories in Kericho Highlands.

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LITERATURE REVIEW

Theoretical Review

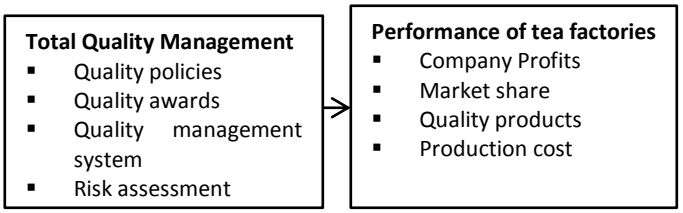
A Theory is a set statement or guideline that explains how widely accepted facts from a given phenomenon that can be used to make judgments about the phenomena. They are tools used to conduct analysis in making inferences or conclusion about a particular event or phenomenon (Hearnshaw & Wilson, 2013). The study used of Quality management theory which postulates the need for total quality management by top management.

Quality Management Theory

Quality management Theory was postulated by Heizer and Render (2005), states that success of an organization is largely determined by management support of quality management practices. The Theory allows firms to monitor and eliminate unnecessary processes and procedures within the organization by successfully implementing Total Quality Management systems.

Tea factories will be able to maintain total quality management in their entire production processes using Quality management theory. This is because tea factories are faced with production challenges that increase the total cost of production. Quality improvement theory provides a framework that identifies and guides managers on production of a hierarchical network and encourages members to participate in quality management (Goetsch & Davis, 2006). Deming (1986) developed a detailed organizational scrutiny cycle called Plan Do Check Act cycle. The Plan Do Check Act (PDCA) cycle of continuous improvement is an all-inclusive idea whose objective is to ensure quality execution. Consequently, it reduces the disparities between the requirements of partners and the execution of quality by tea factories (Goetsch & Davis, 2006). The theory has been widely criticized for its authoritative nature that fails to promote participation of those involved in PDCA cycle. The hypothetical quintessence of the theory is centered on quality worries in coming up with an authoritative framework that does not encourages participation and learning using process administration rehearses (Anderson, Daly & Johnson, 2010). According to Oakland (2012) the theory only focuses on top administration in providing leadership to initiate necessary changes. This is not realistic since implementation of Total Quality Management requires that the employees are also engaged. This theory is relevant for this study as it address how tea factories can improve quality of their tea through adoption Total Quality Management policies and practices.

Conceptual Framework



Independent variables **Dependent variable**

Figure 1: Conceptual Framework

Source: Author (2019)

Empirical Review

Total Quality Management and Performance of Tea Processing Factories

Tea processing industries in China have different ways of getting rid of waste from tea processing industries in United States (Patrick, Kip & Jeffrey, 2010). This was attributed to difference in the desire by employees at all levels to get rid of waste. Among the instruments used to conduct the study were questionnaires, interviews and discussions with staff working in tea processing industries in both countries. The findings revealed that tea factories are adopting lean philosophy in relation to engineering, operations management and entire supply chain management to improve the quality of the products. This model helps in quality improvement, reduction in set up time, and

other waste reduction goals in a manufacturing process. The research model used in the study failed to address behavioral issues, such as how to help Improvement teams function effectively.

Jamali, Ebrahimi and Abbaszadee (2010) conducted a study on TQM Implementation: An investigation of critical success factors identified training as one of the most critical factors in successful implementation of TQM. The main objective of the study was to establish the relationship between total quality management implementation and the performance of tea processing industries in Ghana. Questionnaires and interviews were conducted on employees working in tea processing firms in Ghana. Findings of the study established that implementation of TQM requires adequate relevant employee's skills and knowledge on quality that can only be achieved through continuous training. A critique of the study was the limited scope of employees and tea firms in Ghana. Practices adopted in TQM implementation may not be applicable in other countries.

In a study by Shanshan, Kun, Ren-Yong and Si (2018) in China, there have been several quality changes due to inability of tea processing firm's suppliers to track and observe upstream of individual product quality. The study conducted an ontology-based literature review on journals to determine the role of upstream information flow to tea processing firm's suppliers on quality. The findings revealed that the model revealed information to upstream suppliers on their readiness to exert high-quality efforts on down-stream suppliers. The study recommends that managers should use the model in adjusting variables in a contract to ensure continued efficiency in the entire contract period. Although the study depended so much on previous studies only, it gives room for future studies on related information systems to verify the approach used in the study and the findings.

METHODOLOGY

The study was conducted using a descriptive survey design. The target population for the study was 12 KTDA owned tea factories in Kericho highlands. Data from the 124 respondents of the target population was selected using stratified random sampling technique. Questionnaire with both open and closed ended questions was used as the main instrument for data collection. Questionnaires were self-administered to the sampled respondents. A pilot study was conducted on twelve (12) respondents of Chebut Tea Factory in Nandi County. Sampling units for the study factory unit managers, finance officers, ICT managers, field services staff and production staff. Data collected was analyzed using Statistical Package for Social Sciences (SPSS).

FINDINGS

Total Quality Management Findings

The researcher sought to determine the relationship between total quality management and performance of tea processing factories in Kericho highlands. This helped to establish the extent to which supply chain collaboration influences the performance of tea processing factories in Kericho highlands. Table 1 showed the Total quality management results.

Table 1: Descriptive Statistics for Total quality management results

		SD	D	N	A	SA	Total	Mean	Std. D
The company has documented quality policies and procedures that are used in all production processes.	F	6	8	5	55	39	113	4.00	1.08
	%	5.3	7.1	4.4	48.7	34.5	100.0		
The company has won awards for maintaining excellent quality production standards.	F	7	10	9	22	65	113	4.13	1.25
	%	6.2	8.8	8.0	19.5	57.5	100.0		

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The company has Quality Management System that is reviewed regularly by top management to ensure efficiency and effectiveness in production.	F	9	4	7	55	38	113	3.96	1.13
	%	8.0	3.5	6.2	48.7	33.6	100.0		
Company conducts frequent risk assessment as measure to ensure total quality management.	F	6	6	7	51	43	113	4.05	1.07
	%	5.3	5.3	6.2	45.1	38.1	100.0		

Majority of the respondents agreed that tea factories have documented quality policies and procedures that were used in all production processes in achieving total quality management (M=4.00, Std D=1.08). Moreover, majority also strongly agreed that tea processing factories had won awards for maintaining excellent quality production standards in production of quality tea (M=4.13, Std D=1.25). The respondents also agreed that tea factories had adopted Quality Management Systems that were regularly reviewed by top management in a bid to maintain efficient and effective total quality management in all production processes (M=3.96, Std D=1.13). Majority of the respondents also agreed that tea factories conducted frequent risk assessment as a measure to ensure total quality management (M=4.05, Std D=1.07). These findings were in line with findings of Patrick, Kip and Jeffrey (2010) who found out that implementation of TQM requires policies, systems and frequent risk assessment. This implied that tea factories should implement total quality management practices in all the production processes in order to improve performances.

Performance of Tea Factories Findings

Statements regarding performance of tea factories were issued to respondents. Table 2 showed the performance of tea factories in Kericho highlands results.

Table 2: Descriptive Statistics for Performance of Tea Factories

		SD	D	N	A	SA	Total	Mean	Std. D
The company has enjoyed increased profits in the recent years.	F	5	8	3	37	60	113	4.23	1.09
	%	4.4	7.1	2.7	32.7	53.1	100.0		
Quality tea production has enabled the company to widen its market share.	F	5	8	4	40	56	113	4.19	1.09
	%	4.4	7.1	3.5	35.4	49.6	100.0		
Quality tea production has enabled the company to widen its market share.	F	5	6	3	39	60	113	4.23	1.05
	%	4.4	5.3	2.7	34.5	53.1	100.0		
The company has reduced production cost with the adoption of total quality management practices	F	5	8	5	23	72	113	4.32	1.13
	%	4.4	7.1	4.4	20.4	63.7	100.0		

Majority of the respondent strongly agreed that their tea factories enjoyed increased profits in the recent years as a result of improved performance (M= 4.23, Std D=1.09). To determine if Quality tea production has enabled the company to widen its market share, majority of the respondents indicated that they strongly agreed with the statement (M=4.19, Std D= 1.09). On whether *Quality tea production has enabled the company to widen its market share*, the respondents strongly agreed (M=4.27, Std D= 1.05).

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Lastly, the respondents strongly agreed that tea factories had reduced *production cost with the adoption of total quality management practices* (M=4.32, Std D= 1.13). The results show that tea processing factories in Kericho highlands benefited a lot from the adoption lean procurement practices. These findings were in line with the findings of Martin & Barth (2018) who established that performances of tea factories is about lean production through elimination of unnecessary modes of transport, over stocking, ensuring equipment utilization, reduction in production delays, reduction of excessive production that leads to excess waste and ensure maximum utilization of labor. The findings to a large extent corroborate with the findings of Venkateshwarlu, Ashish and Manoj, (2011) which found out that firms can improve their performances with adoption of lean procurement practices. Tea factories in Kericho should therefore adopt lean practices in order to improve their performances.

Summary of Findings

Total Quality Management, employee involvement and Performance of Tea Factories

The objective sought to determine the influence of total quality management on the performance of tea processing factories in Kericho highlands. The study found out that total quality management was positively and significantly related to performance of tea processing factories in Kericho. Most tea factories maintained quality of tea using quality policies, frequent risk assessment and quality management systems that had enabled them to receive quality management awards. This therefore meant that total quality management is critical determinant for performance of tea factories. Findings therefore meant that the null hypothesis that there is no significant relationship between total quality management and performance of tea processing factories was rejected.

With regard to performance, the study found out that the tea factories enjoyed substantial profits, realistic market share, produced quality tea and enjoyed production cost saving from adoption of lean procurement practices. Other benefits highlighted by the respondents include reduction of waste, reduction in holding excess packaged tea stocks and good customer satisfaction. Findings therefore established that performances of tea processing factories relied heavily on total quality management.

CONCLUSION

Total quality management was concluded to having an influence on performance of tea processing factories in Kericho. Total quality management can be achieved through adoption of quality policies and quality management systems.

RECOMMENDATIONS

KTDA management should strive to implement lean procurement practices not only in tea factories in Kericho but also other tea factories within KTDA jurisdiction. Factory unit managers as the CEOs of their respective tea factories should ensure that employees are well conversant with the lean procurement practices

The study recommended implementation of theory of quality improvement principles that postulates that top management are responsible for quality improvement in an organization. Two-factor theory also confirmed the benefits of engaging and motivating the employees in order to improve productivity and reduce resistance

Suggestions for Further Studies

The study was limited to tea processing factories in Kericho only. Future studies should further explore on other tea growing regions to establish the relationship between total quality management and performance of tea factories. The study also gave room for future studies to incorporate other sectors like coffee, pyrethrum, cotton and many more. Although total quality management was found to

have a direct correlation with performance, long term relationship was not tested. Future studies should incorporate both longitudinal and cross-sectional studies to confirm this**.**

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