EFFECT OF INNOVATION ON PERFORMANCE OF KTDA MANAGED FACTORIES IN MERU COUNTY, KENYA

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Abstract: The tea sector plays a major role as it contributes 11% of agricultural sector contribution to the GDP and 26 % of total foreign exchange. The small scale farmers process and market their tea through Kenya Tea Development Agency (KTDA). With the ever-fluctuating global tea prices and ever-increasing production costs and KTDA being a price taker, it has to survive its mandate by reducing the cost of production. The purpose of this study was to establish the effect of innovation on performance of KTDA managed factories in Meru County. A questionnaire was used as the method of data collection for primary data and a structured data collection sheet was used to collect secondary data. A sample size was 79 respondents comprising of 27 managers and 52 workers. T-test statistic was computed for innovation and the results indicated that the method was statistically significant in cost reduction. This study concluded that innovation had a positive effect on the performance of KTDA managed factories. The study recommends the factories to continue implementing the strategies and more innovative methods to be explored.

Keywords: Innovation, performance, small scale farmers, cost

INTRODUCTION

Kenya is the leading exporter of black tea in the world followed by China, Sri-lanka, India and Vietnam in that order. In Africa, Kenya is the largest producer and exporter of Black CTC tea. Over 95% of the tea produced in Kenya is exported while the rest is consumed locally. Tea plays a key role in the economy as it is the third foreign exchange earner after tourism and horticulture; it contributes 26 % of total foreign exchange earned in the country. Tea contributes 11% of agricultural sector contribution to the gross domestic product (Tiampati, 2014). Tea is main livelihood of many farmers and it is one of the notable that among the many of Kenya's export crops, tea is one of those crops that have maintained on an upward trend in production and export earnings (Nguyen, 2009). The total revenue from tea in 2016 was 84 billion compared to a total of Kshs 64 billion revenue in 2015. This clearly shows that tea is of key importance to the Kenyan economy.

Tea in Kenya is grown in large scale and in small scale. The large scale tea is mostly owned by large scale farmers and multinational companies. Large scale farmers produce about 40% of the tea in Kenya (Kagira et al, 2012). The large scale farmers produce and export their tea. Small scale farmers on the other hand process their tea through KTDA.

Nyangito (2001) defines small holder farmers as those who farm in less than eight hectares of tea farms. According to Tiampati, (2014), small scale farmers produce 60% of the total tea produced in Kenya. Currently, KTDA manages 66 factories owned by over 600, 000 small scale tea farmers. The farmers collectively own the tea factories and they process and market their tea through these factories. Since the farmers do not have the capacity to process and market tea on their own, they contract the Kenya Tea Development Agency to manage on their behalf. After liberalization of the tea sector in 2000, KTDA is mandated to manage the cash crop from cultivation, extension services, production, and procurement of farm inputs (fertilizer), transport logistics, warehousing and marketing of tea all on behalf of the farmers. (Kimathi & Muriuki, 2012). As per stakeholders' theory, KTDA is expected to manage the factories efficiently in order to maximize the return to farmers/ shareholders which greatly impacts on the livelihood of over 600,000 tea farmers in Kenya who deliver green leaf to the 66 tea factories managed by the agency. Maximizing returns to these farmers will be of great economic value.

According to Nguyen, (2009) tea production processing and marketing is an involving process where huge resources and a lot of logistics are required. Due to increase in inflation, the costs items supply to KTDA and cost of services has continued to increase. On the other hand KTDA is a price taker in the global market. Despite the increase in cost of production, KTDA cannot increase its price so as to cushion its returns to farmers. The high costs of production and fluctuating global market prices thus threaten its survival. For KTDA to retain high returns to farmers and survive in the harsh economic times, it can only mitigate the ever increasing costs by minimizing them. The high costs, particularly the cost of labour, inputs and energy are its key challenges, had to be mitigated. (Namu et al, 2014).

To mitigate the cost challenge, KTDA has invested in innovative strategies as part of its strategic plan in order to survive. KTDA has set its strategic plan (2015-2019 strategic plans) with its main objective being to improve on operational efficiency at low cost. Some of the strategies were achieved in the 2009-2014 strategic plans but their effect in the performance has not been documented. The purpose of strategies by KTDA geared towards gaining a competitive advantage during the harsh economic times. Some of sources of competitive advantage are cost, quality, service and technical leadership (Stevens, 2001). KTDA used strategic cost management as a survival tool during the harsh economic times. Strategic cost management is the application of cost management technique so that they simultaneously improve the strategic position of the firm and reduce costs. Strategic cost management is a tool for competitive advantage and results from blending of strategic positioning strategy, value chain analysis and cost driver analysis. (Shank & Govindarajan, 1993)

One of strategic cost management techniques has been of innovations. The adopted innovations are process innovation and organizational innovation (Kiai, 2014). KTDA introduced the Electronic green leaf Weighing Solutions (EWS) which are machines that allow instant data processing in the buying of green leaf thus reducing the number of employees in the leaf buying. Rayport and Bernard (2001) found the EWS had an impact on the cost of procuring the raw material (green leaf). Another innovation is the introduction of a continuous fermenting machine (CFU) that is automated to ferment tea in place of fermentation trolleys. This machine is a great innovation in KTDA as it can be operated by one person thus replacing 40 workers (Kimathi and Muriuki, 2012; Sayi, 2014)

Problem Statement

The importance of tea in Kenya cannot be underestimated. Tea is the third foreign exchange and contributes 26% of total foreign exchange (Tiampati, 2014). Tea is also main livelihood of many people as over 600,000 farmers rely on tea as a source of income (Ng'ang'a & Kiai, 2016). Despite the key role played by the tea sector, this sector has been under threat due to ever escalating costs of production in terms of labour costs, energy costs, and even heavy taxation imposed to it (Tiampati, 2014; Kimathi & Muriuki,2012). To save tea farming from the high costs, KTDA has undertaken innovations as a way of cost reduction. The purpose of this study was thus to establish the effect of innovations on performance of KTDA managed tea factories in Meru County.

Specific objectives:

To determine the effect of innovation on performance of KTDA managed factories in Meru County.

Literature Review

The theory guiding this study was strategic management theory, which is more of a combination of various theories. It has been indicated that, strategic management is that process and approach of specifying the organization's broad objectives, developing the necessary policies and plans to achieve these broad objectives. It also involves allocating resources so as to implement the policies and plans (Raduan et al., 2009).

Raduan et al., (2009), also indicated other theories that forms the foundation of strategic management . The other theories that have been indicated includes, the resource based theory, profit maximizing theory, the survival based theory, the human resource based theory, competition based theory the contingency theory and the agency theory and.

This study was anchored under survival based theory and agency theory The survival-based theory centers on the fact that organisations need to always adapt to its competitive environment for it to survive. Organizations developed strategies in order to survive in the competitive and harsh economies. The other theory is agency which stresses on the underlying important relationship between the agents or managers and

shareholders or owners. Omari et al, (2011) studied the agency theory and concluded that it is the mother of the strategic management theory as this theory affirms is that human resources is a great source of the firm's competitiveness. The other strategic management theory fully depends on the agents in the whole process of strategic management for the achievement of organizational success.

The agency theory is a management approach where one party (agent) acts on behalf of another (the principal) and is supposed to advance the principals goals (Jean et al, 2002). The agent therefore advances both the principals' interests and his own interests in the firm. A harmony of the interests by agents and principals should be merged in order to arrive at the corporate objectives of the organization. This should be done through the agents in the organisations as they are in charge of the vast resources of the organization.

The agency theory concept applies in KTDA in that the small-scale farmers are many and are not in capacity to manage the factories on their own. Therefore they appoint the agency (as agents) to manage them on their behalf. The farmers act as agents. They elect their own directors who in turn by extension act as agents in the fact that they represent the interest of the shareholders. The directors are policy makers and do focus on the hierarchies of strategic formulation using different managers at every level as agents parse of the principals (Omari et al 2011)

Michael Porter (1985), identified three generic strategies namely cost leadership, differentiation and focus. The first two (cost leadership and differentiation) seek competitive advantage in a broad range of industry segments. Uniqueness and cost drivers drive differentiation and cost leadership respectively. (Porter, 1985) Focus aims at cost advantage (Cost focus) and differentiation advantage (Differentiation focus) in a narrow segment. (Porter, 1985)

The strategic logic of cost leadership requires a firm be the cost leader not the one of the several firms vying for the position. In differentiation, an organisation tries to be unique in its industry in certain dimensions that are widely valued by the customers or buyers, while focus rests on choice of a narrow competitive scope within an industry. The focuser selects a segment or even a group of segments in an industry and serves them in exclusion of others. (Porter, 1980; 1985)

Organizations that implement cost leadership strategy tries to employs several activities such as accurate demand forecasting, high capacity utilization, economies of scale, process innovation, technology advancement, outsourcing and learning/experience curve (Bordean et al., 2010; Porter, 1985). Hill, (1988) as cited by Mutunga and Minja (2014) argued that conditions which favour cost leadership such as reduction in transaction costs, process innovation, learning and scale effects, are independent from those that favour differentiation (such as consumer preferences, product innovation and quality differentiation) based on firms superiority in a complex value system. In Kenya, cost saving is a major consideration in industry due to high cost of raw materials, labour, operational overheads and energy. Cost saving or reduction forms the basis of my study in the tea industry in Kenya.

Joseph A. Schumpeter who came up with innovation theory, believes that innovation is a new combination of the production function with the aim of obtaining excess profits or survive turbulent business environment. (Schumpeter, 1934) As cited by Jenssen & Nybakk, (2012) innovation can be defined as the propensity of firms to create and adopt new manufacturing processes, new products, and business systems.

An issue facing companies today is how to create and maintain a competitive advantage within a turbulent and complex business environment, often in a turmoil, facing unpredictable and unstable future. For the companies to survive the turbulent business environment they have to adjust and realign their business strategies. According to Hilman et al (2014) there is need to align a cost leadership strategy (business strategy) and process innovation (functional strategy) to produce better performance based on strategic alignment among organizational strategies approach. Innovation can be summed up into five types; producing new products, introducing new process and new production methods, exploiting new markets, developing raw materials or semi manufactures supply sources and finally introducing or redesigning new organization. The five innovation forms can be put into two forms; technological innovation and organizational innovation (Hillman et al, 2014)

O'Sullivan and Dooley (2009) noted that process innovation is that act of making changes that are beneficial in the process of producing the products/services. Crucially, process innovation is all about operational activities in order to attain competitive advantage by enhancing the quality of offerings and efficient delivery method than competitors. Meanwhile, Wang & Ahmed (2004) stated that process innovation is considered as introducing new management approaches, new production methods and technology to improvise the production and management process. In 2011, Gunday, Ulusoy, Kilic, & Alpkan stated that process innovation assist the

organization to reduce the cost of production, enhance quality features and also reduce distribution costs. Additionally, Qin (2007) mentioned that process innovation is allows organizations achieve economies to scale, reduce cost and gain market share.

Process innovation involves the implementation of a considerably improved delivery or production method. It includes significant changes in equipment, techniques and/or software (OECD Oslo, 2005). The OSLS manual considers organizational innovations in business practices as the implementation of new methods of organizing routines and procedures for the execution of conduct of work. Organizational innovations involve the following: new practices aimed at improving learning and knowledge sharing within the organization; introduction of management systems for general production or supply operations, lean production, business re-engineering and, quality management systems (OECD Oslo, 2005). Process innovation is usually adopted with the intention of decreasing unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products (OECD Oslo, 2005). As cited by Nybakk and Jenssen (2012), a large body of research concerning the relationship between performance and innovation and exists and has found that innovation is a key component for long-term firm success. It is also argued by scholars that innovative businesses are more successful than others are.

RESEARCH METHODOLOGY

This study was guided by descriptive survey design for undertaking the study where both quantitative and qualitative data was collected. On primary data, it was collected by use of structured questionnaire while secondary data was collected using a structured data collection sheet. The total target population was 66 KTDA managed factories. The accessible population was KTDA managed factories in Meru County, which are seven. The study targeted all the employees in functional managerial level, all section's supervisors and extension services employees. The choice of the respondents was judgmental as these employees are involved in decision making in the organization and thus they were expected to more knowledge on cost management.

DATA ANALYSIS, FINDINGS AND DISCUSSION
Response Rate and Respondents Profiles

Seventy nine (79) questionnaires were issued to randomly selected managers and supervisors for 7 factories. Sixty four (64) returned representing a 81% response rate. The study noted all the factories had same level of number of employees as they were all in 101 to 250 category. The average number of tea bushes in the factories is 12.8 million with an average of 8,454 farmers. The productivity of tea was seen to be increasing for the last five years with a minimum of 12.8 Million Kgs 2011/2012 financial year to an average of 18 million in 2015/2015. Majority of the respondents were aged between 36 to 40 years (23.9%). The rest of respondents (21%) fell within the age of between 25 and 30 years. Few youth are working in the factories. Majority of the respondents (35.9%) were in supervisory position. Those who were in managerial position were 34.4% while 29.7% were in extension services. On education level, analysis indicated that majority of the respondents was diploma level at 40.6 percent. This was followed by degree level at 32.8%, craft training 15.6%, secondary training 10.9%.

The effect of innovation on performance of KTDA managed factories in Meru County.

The objective the study was to find out the effect of innovation on performance of KTDA managed tea factories in Meru County. The innovations undertaken by the factories which were considered in this study were process innovation and organization innovation. Under process innovation, implementation of Continuous Fermentation Unit (CFU) was evaluated. On organizational innovation, the study looked at Electronic weighing scale (EWS).

First, the study sought to find out the employees perception on the purpose of implementation of both CFU and EWS. The results are as indicated in Table 1 and it was noted that the reducing cost had the highest rating of 4.56 out of a maximum of score of five. This was followed by improving efficiency where the average score was 4.3. The parameter that was rated low was to reduce cost of energy as this was rated 1.6591. The average score for all the parameters was 3.29 with a standard deviation of 1.35.

Table 1: Responses on Objective of introduction of CFU (Process Innovation)

	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Std. Error
To reduce on labor cost	3.00	5.00	4.5568	.60378	-1.024	.257
To reduce on energy costs	1.00	5.00	1.6591	.80067	1.249	.257
To improve quality of made tea	1.00	5.00	3.8977	.93514	-.569	.257
It is the trend in the industry	1.00	4.00	2.0114	.55697	.414	.257
To improve efficiency	3.00	5.00	4.3068	.79304	-.611	.257
Average			3.2864	1.35118	-0.5135	

The repossess from this table indicates that majority of the respondents agreed that, innovation has achieved the expected objectives. An average score of 3.2 and a standard deviation of 1.35 indicate high rating by respondents.

On the EWS, the parameter that was rated highly was improving efficiency in data processing, which scores 4.3. This was followed by real time monitoring of tea collection which was rated 3.93 and improving on control on the green leaf collection at 3.78. The one, which was rated least, was improving the outturn which was rated 1.82. On average, the respondents rated achievement of this innovation at 2.83 and standard deviation of 0.924.

Table 2: Responses on objective of introduction of EWS (Organization Innovation)

	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewdness Statistic	Std. Error
Reduce on cost of labour	1.00	5.00	3.0000	1.53877	.000	.257
Improve efficiency in data processing	3.00	5.00	4.2955	.71373	-.503	.257
Improve on control on the green leaf collection	1.00	5.00	3.4773	1.22218	-.410	.257
Improve on the time needed for data processing.	1.00	5.00	2.8864	1.18837	.393	.257
Reduce stationery costs	1.00	5.00	1.8409	1.20236	1.613	.257
Help in planning	1.00	5.00	2.1818	1.10947	.974	.257
Real time monitoring of tea collection	2.00	5.00	3.9318	.93213	-.472	.257
Compute the farmers' payment promptly.	1.00	4.00	2.0568	.76351	.537	.257
Improve the outturn	1.00	4.00	1.8182	.92904	.902	.257
Average			2.8321	0.9242		

From the table, the result indicates that the respondents agreed that the innovations have achieved the stated objectives.

To answer the research question, the study tested the effect of the innovations on the performance of the factories. To achieve this, the study evaluated the performance of the factories before innovation and with innovation. The study collected the average cost of production before innovation and with innovation, and the

return to farmers before innovation and with innovation. The results are as indicated in Table 3 and Table 4. The table indicates that before innovation, the average cost of producing one kilogram of made tea was Kshs 82.20. With the implementation of the innovations, the average cost of producing one kilogram of made tea was Kshs 68.53.

Table 3: Average cost of production

	Mean	N	Std. Deviation	Std. Error Mean
Average cost before innovation	82.2038	7	5.80395	2.05201
Average cost with innovation	68.5313	7	2.79101	.98677

The results from Table 3, indicate that, with innovation, the cost of production fell by Kshs 13.67. On the return to farmers, the results indicated that, the average return to farmers was 63.55% before innovation. With innovation, the return to farmers was 74.66%.

Table 4: Average return to farmers

	Mean	N	Std. Deviation	Std. Error Mean
What is the average percentage return to the farmers Before Innovation	63.5500	7	10.11180	3.57506
What is the average percentage return to the farmers with Innovation	74.6625	7	2.68804	.95036

These results indicate that, with innovation, the return to farmers improved by 11.11 percent.
This study went further to find out whether the changes in cost of production and the change of return to farmers were statistically significant. To achieve this, a t- test was done and the results are in Table 5. The table indicates $t = 7.069$, degree of freedom = 6, p-value 0.000.

Table 5: T-test for average cost

	Paired Differences Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Sig. (2-tailed)
Average cost before innovation - Average cost With innovation	13.67250	5.47052	1.9341	9.099	18.245	7.069	6	.000

These results indicates that, there was a statistically significant difference in average cost before innovation (M=82.20, SD=5.80) and with innovation (M=68.53, SD=2.79), t = 7.069, degree of freedom = 6, p-value 0.000. On the return to farmers, the study also carried a t-test to find out the effect innovation on return to farmers. The results indicated a t value of -2.837, degree freedom = 6, p-value 0.025.

Table 6:   T-Test for Average Percentage Return to the farmer

	Paired Differences Mean	Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Average percentage return to the farmers Before Innovation What is the Average percentage return to the farmers with Innovation	-11.112	11.07	3.916	-20.37	-1.85	-2.83	6	.025

Again, it was noted there statistically significant difference in return cost before innovation (*M*=63.55, *SD*=10.11) and with innovation (*M*=74.66, *SD*=2.68), t = -2.837, degree of freedom = 6, p-value 0.025.
From the analysis, this study was able to answer the study question on whether innovation and any effects on the performance of KTDA managed factory. The results give the answer to the question by indicating that innovation has a statistically significant effect on the performance of KTDA managed factories.

Discussion

The purpose of the study was to find out the effect of innovation on performance of KTDA managed factories. The study found that tea factories employ similar modern strategic approaches in ensuring sound management of their factories with a view to compete favorably in the liberalized business environment. A range of modern day strategic approaches are employed by most of the tea factories in the type of cost strategy employed (Keraro et al, 2012). Some the strategies that have been recognized included process innovation where CFU has been implemented and organization innovation where EWS has been implemented.

The findings of this study revealed that introduction of CFU and EWS had a positive effect on performance of KTDA managed factories. This agrees with others scholars who studied their impact on performance. These results were similar to study done by Kiai and Wambui (2014). Their study was on the impact of process innovation on financial performance of KTDA managed factories in Meru and Kirinyaga Counties. In their study, they concluded that adoption of CFU had a positive impact on performance due to its mitigation of the escalating labour costs. The study further noted that, the introduction of EWS enabled instant data capturing from the farmers to the factory thus reducing the time and cost of leaf buying.

Another study on innovation was by Namu et al, (2014). In their study their study on the impact of cost reduction strategies in Embu County, they sampled 225 farmers and 40 employees and 18 managers. The study found that the use of EWS has led to accurate measures thus minimizing leaf loss for the farmers. Computerizations of operations in firms lead to reduced manual work thus reducing labour costs. Their findings also support that CFU technology eliminated human intervention in the process of fermentation of tea resulting to greater consistency of quality of made tea, more efficient production and lowering labour costs since a single CFU replaced almost 40 workers.

The labour cost was also found to be a major threat to the performance on KTDA managed tea factories (Kimathi & Muriuki, 2012). Kimathi & Muriuki (2012) indicated, one way of minimizing operational costs were by changing the technologies in the factories. They indicated that there was need to adopt more efficient technologies.

The strategies adopted by these factories auger well with Porter (1985) strategies. Porter (1985) identified three generic strategies namely cost leadership, differentiation and focus. The factories adopted cost leadership to seek competitive advantage in the industry which has a challenge of ever escalating cost. Cost leadership is driven by cost drivers (Porter, 1985).

The objectives of the organizations in adopting innovation has been a way of reducing cost, of which it has been found that this objective was achieved. According to Gunday, Ulusoy, Kilic and Alpkan (2011), process innovation assists the organization to reduce the cost of production, enhance quality features and reduce distribution costs. Additionally, Qin (2007) mentioned that process innovation is assisting the firms to achieve economies to scale, reducing the cost and gain market share. Thus the results of this study agree with the result of other studies.

Conclusion

The study concludes that there is a positive effect of cost reduction strategies on the financial performance of tea factories. The cost reduction strategies help in minimizing costs of production as well as costs of labour that having a positive impact on the return to the farmer. Automation of key processes in tea processing has led to improved efficiency and reduced costs.

Recommendations

KTDA has attempted to save the sector by introducing innovative strategies. The strategies as shown in the study have gone a long way to improving the returns to the farmer by saving on costs especially labour costs. This study recommends that the factories should continue using the cost management strategies and more innovations should be introduced. Secondly, despite the cost reduction strategies, KTDA needs to explore other markets rather than rely on traditional markets. Any fluctuation in these markets directly affects the farmer and also the performance of these factories.

Third, there is need for intervention by the government to reduce on the taxation and levies imposed on the tea sector as it dwindles the farmers' earnings. Recently, the government has scrapped the Ad valorem levy on exports but more needs to be done for the farmer. The government needs to give farmers subsidy on imported fertilizer which would have a positive impact on farmers' returns. The government needs to intervene due to inflation as it also affects the farmers' earnings.

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