



Effects of quality of coffee on performance of coffee industry in Kenya

Peter Ngibuini Kuguru

Full Length Research Paper

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Peter Ngibuini Kuguru

The Management University of Africa, Kenya. E-mail: peter@kuguru.com

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This study sought to determine the factors affecting the performance of the coffee industry in Kenya with a case study of Mathira Constituency. The study sought to find the existing linear relationship between the factors affecting the coffee industry and performance of the coffee industry. The factors that were considered included grading, taste, appearance and level of acidity. The study was grounded on public interest theory of regulation, total quality management theory and Theory of Performance. Mixed mode research approach was used which consisted of the descriptive research design and correlation research design. Simple random sampling technique was used and the sample consisted of 385 respondents out of a population of 26,000 farmers. The study involved a primary data collection from the coffee farmers and the coffee cooperative society managers. The collected data was edited, coded, keyed in and analyzed using Statistical Package for Social Sciences (SPSS). The study findings showed that all the factors have a positive significant relationship with the performance of coffee industry in Kenya. The factor combined accounted for 28% of the performance of coffee industry. Quality of coffee had a significantly positive relationship with the performance of coffee industry in Kenya. Based on the findings above the study concluded that quality of coffee produced, grower's capacity, government policies and marketing process are significantly related to performance of coffee industry in Kenya. The study therefore recommended that CBK, government of Kenya, donors, coffee farmers in Kenya and others policy makers should support production of coffee from harvesting to processing to be done in a manner that will maintain the high quality of final coffee which will attract high prices hence revitalizing the coffee industry. CBK should also intervene to train farmers on how to maintain healthy crops that will lead to high quality produce. The key players should come up with new strategies to market Kenya coffee to fetch good prices.

Key words: Quality of coffee, performance, mathira constituency, coffee industry

INTRODUCTION

Background Information

The quality of coffee is one of the major factors that determine the prices of coffee. Coffee from producers passes through several value chains before reaching the consumer. Arabica coffee is more favored by consumers in general than Robusta. Arabica coffee is native to Ethiopia and it represents around seventy percent of world coffee production. On the world market, Arabica coffee brings the highest prices. Arabica is more climate sensitive than Robusta and needs mild temperatures for optimum quality produce while Robusta is comparatively climate resistant and needs less agronomic attention.

Robusta coffee contains about 50 to 60 percent more caffeine and has a unique taste compared to Arabica. Robusta coffee is mainly used for making instant coffee and for blending purposes.

Kenyan coffee is well-known and well-liked, both in both the United States and Europe. Kenyan beans produce a singular cup with a sharp, fruity acidity, combined with full body and rich fragrance. Coffee is grown on the foothills of Mount Kenya, often by small farmers. Kenyan producers place an emphasis on quality and as a result, processing and drying procedures are carefully controlled and monitored. Kenya has its own

unique grading system. Kenyan AA is the largest bean in a 10-size grading system and AA+ means that it was estate grown.

Coffee is the sole economic activity to which thousands and thousands of rural families entrust their economic survival (Gichuru, 2002). It had been such that since 1998, coffee farmers had faced difficult times. Payments for the crop started declining and before then, farmers in the division never had difficulty paying for the education of their children (World Press Review, 2002). The farmers were able to develop their farms using proceeds from coffee. But that changed and most farmers were then considering abandoning coffee farming altogether for food crops.

The prices in the world market continued to fall and caused confusion in the local cooperative society as the world market was the main consumer of the crop. As a result, the giant Mathira Coffee Farmers Cooperative Society was subdivided in 2000, as it was unable to supply for the financial needs of its members. The farmers were forced to sell their coffee at farm-gate price while at the same time the buyers were dictating the prices (World Press Review, 2002). Farmers would get loans at the beginning of every school term to take care of fees for their children but that increasingly got difficult. The problems persisted as the splinter cooperative societies were also unable to cope with the financial demands of its members. The Kenya's coffee industry was a very promising industry in that it was one of the leading foreign exchange earners in the country. The farmers had to be able to practice standard agricultural activities but that could not be realized when the farmers' income was low such that they could not provide for their families' basic needs. It is against this background that this study intended to find out the effects of quality of coffee produced on the performance of coffee industry. The study sought to answer the research question; does the quality coffee produced affect the performance of coffee industry?

Literature Review

In this section the study analysed some of the theories that explain the performance of sectors. Previous studies on the effects of quality of coffee on performance were also reviewed.

Theoretical review

There are several theories that explain quality improvement. For instance, Scudder (2013) argues that Total Quality Management (TQM) is a quality improvement body of methodologies that are customer-based and service oriented. A popular TQM theory is Deming's theory of Total Quality Management. The theory rests upon fourteen points of management he identified, the system of profound knowledge, and the Shewart Cycle (Plan-Do-Check-Act). Deming's system of

profound knowledge consists of the following four points: System Appreciation which explains an understanding of the way that the company's processes and systems work, Variation Knowledge which explains an understanding of the variation occurring and the causes of the variation, Knowledge Theory which explains the understanding of what can be known and Psychology Knowledge which examine the understanding of human nature. This theory is deemed relevant since it argues that any industry should have quality system in order to yield quality products which also apply to coffee industry in Kenya.

On the other hand, Crosby theory which emphasizes that quality is neither intangible nor immeasurable. It is a strategic imperative that can be quantified and put back to work to improve the bottom line. Acceptable quality or defect levels and traditional quality control measures represent evidence of failure rather than assurance of success. The emphasis, for Crosby, is on prevention, not inspection and cure. The goal is to meet requirements on time, first time and every time. He believes that the prime responsibility for poor quality lies with management, and that management sets the tone for the quality initiative from the top.

The theory of performance is also based on several axioms for effectiveness in improvement of performance. These include immersion, performer's mind-set and engagement in reflective practice (Sonnentag & Frese, 2001). Immersion into one's environment enables one to develop physically, intellectually and socially hence improving one's social relations, emotions, active learning, and knowledge alignment.

To ensure high level of performance the performer's mind-set is a very essential factor as it engages positive emotions towards the activity and enables the performer to consider failure as a stepping stone to achieving high level of performance. In this regard the farmer's mind-set is essential in decision making on whether to invest in coffee farming or divert to other avenues of production for better profits (Bransford, Brown & Cocking, 2000). Reflective practice creates a platform for one to observe the current performance of an industry, examine the accomplishments, carry out an analysis of strengths, weaknesses, improvements and develop identity thus working for the improvement of the entity.

Elger (2014) in his rationale for performance theory indicates that human beings are able to accomplish extraordinary things in the universe. For example, humans can go to the moon and carry out other activities not because of their ease but because they are hard since the objective will be to measure and organize the individual's skills and energies. He refers to performance as a journey that is classified into levels in which the higher the level the higher the quality and level of effectiveness. The theory recognizes the characteristics of higher performance level to be capability and capacity of the activity, knowledge and skills level, cost

effectiveness, quality of the product or the resultant factor and finally motivation and identity (Tomlinson et al, 2002).

Empirical review

A review of the global coffee markets indicates that the current coffee crisis is caused by major imbalances between supply (production) and demand (consumption). Whereas coffee production has been increasing at an annual rate of 3.6%, its demand has been increasing by a mere 1.5%. Global coffee production in 2001/02 is estimated at around 113 million bags, which combined with world stocks of 40 million bags add up to 153 million bags. Production is projected to increase to 119.6 million bags in 2002/03 after taking into account the record crop expected from Brazil. In the last decade production of Arabicas increased by 12% while robustas production increased by 53% with major increases in Brazil and Vietnam. This has led to oversupply of low quality coffees in the world market (Karanja and Nyoro, 2002).

Minten, et al., (2014) carried out a study on structure and performance of Ethiopia's coffee export sector. The study used a number of secondary data sources. First, data were obtained from the National Bank of Ethiopia (NBE) on monthly coffee exports for the period 2002 to 2013. These data were used to calculate trends, 12-month moving averages, as well as seasonal movements. Second, the International Coffee Organization (ICO) calculates an international composite price for coffee based on future contract prices recorded on the London and New York stock exchange. Historical monthly data were downloaded from their webpage. Third, a database of coffee export transactions is maintained by the Ministry of Trade. This export transactions dataset for the period July 2006 to June 2013 was used. An important aspect in coffee exports was quality. Coffee quality assessments for exports were conducted by the Coffee Liquoring Unit (CLU) to ensure that it meets export standards. After buying coffee on the ECX trading floor (or, before 2009, at the coffee auction), exporters pick up the coffee from regional ECX warehouses and it undergoes further processing to meet export standards.

Quality in this context imply the standard of coffee produced as measured against other coffee; the degree of excellence of coffee. Kirumba & Pinard (2010) conducted a study on the factors that determine the compliance of farmers with the recommended standards for coffee eco-certification. The study used the binary logistic regression model to show that socio-economic, institutional factors and farm characteristics are of essence in farmer's certification. The findings of the study showed that the farmer's perception on the benefits of coffee, annual production of coffee, spraying of the coffee crop and having coffee as key source of income are the determining factors for compliance to certification. The study further pointed out the financial status of the farmer

as a growing concern for certification since the certifiers concentrate on the progressive farmers and leave out the weak farmers the study concentrates on the growers capacity but less is said on the ratio of farm price to auction price, government policies, contract price as well as lead time for payment which play an imperative role in demand for certification.

Mwangome (2011) indicated that liberalization of coffee marketing rules led to increase in price per kilogram between 2004 and 2008, there was increased income by the farmers with the percentage pay out increasing from 65% to 83%, and a substantial reduction of coffee output. The reduced production was associated with changes in weather patterns as well settlement in the areas that were previously coffee farms due to increase in population in the area. The study further identified that the coffee quality in the area is still high owing to introduction of improved coffee varieties and increased price incentives fetched from the high quality coffee. The study identified the need to reduce marketing agents, reduce taxation on coffee, infrastructural development, introducing strict regulation as well as expanding the international markets for coffee. Despite the indicated increase in coffee prices the study did not consider the diminished growers capacity as well as put into consideration the demotivating to the farmers as a result of lead time for payment and ratio of farm price to auction price.

The constraints faced by small scale coffee producers have contributed in the production of low quantity of coffee with relatively low quality. According to USAID (2010), these constraints include low capital with limited access to credit, lack of adequate knowledge on farm management, failure to adopt varieties that are resistant to diseases, lack of quality premiums and poor economies of scale in the cooperative societies. The value chain analysis study further highlights the use of obsolete equipment which was installed during the colonial times as a major problem that affects wet processing of coffee in the country hence exporting most of the locally produced coffee. Poor management of cooperatives is also detrimental to the coffee industry. Despite the study identifying the most critical factors leading to the decline of coffee production the government policies and poor payment of the coffee growers despite the high cost of Kenyan coffee in the market have not been adequately addressed.

Conceptual Framework

Quality of coffee is an imperative in the determination of the performance of coffee industry. Different countries yield different quality of coffee due to their differing climatic conditions, varied soil acidity and employment of different processing mechanisms. This therefore triggers the need to determine the impact of the grade of coffee, the taste, appearance and level of acidity in the

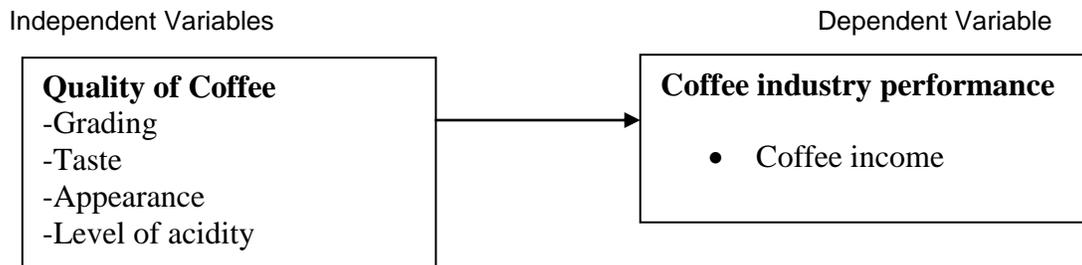


Figure 1: Conceptual Framework

performance of the coffee industry (figure 1).

METHODOLOGY

The study adopted a descriptive research design. Descriptive research design enhanced clear examination of the research topic and also facilitated data collection process by answering questions concerning the study as per the current status (Gravetter & Forzano, 2011). A descriptive survey entailed the collection of information by administering a questionnaire to a sample from the entire population of study. The study targeted the managers of coffee cooperative societies and coffee farmers in Mathira constituency. The study used primary data collected from a representative sample of the entire population via questionnaires which was used to solicit information as per the objectives of this study. The target population in this study was 26, 000 coffee farmers inclusive of factory managers in Mathira constituency. Simple random sampling technique was used in this study. Primary data was of essence in this study as it allowed the researcher to address issues that are specific to their study. Primary data was collected from respondents via questionnaires. The questionnaires were administered to the coffee cooperative society managers, who are the project representatives, and to the randomly selected members of the community by the researcher. The questionnaire comprised of the questions that intended to answer the questions formulated with reference to the objectives of the study and the research questions. The researcher furnished the respondents with an introductory letter issued by the university to instill confidence into the respondents. Piloting was carried out to assess the ability of research instruments in collecting viable and reliable data that corresponded to the objectives of the study. The research yielded quantitative and qualitative data. The quantitative data was analysed using both descriptive statistics and correlations. Descriptive statistics helped to get the measures of central tendency and measures of dispersion which included the mean and standard deviation. The study used the quantitative method of data analysis. Data analysis played an important role in conversion of raw data into a form that can be subjected to statistical interpretation and presentation. The collected data was

Table 1: Response Rate

Response	Frequency	Percent
Returned	385	92.5%
Unreturned	31	7.5%
Total	416	100%

edited, coded, keyed in and analysed using Statistical Package for Social Sciences (SPSS). The researcher upheld ethical issues in the process of the study and gave respondents assurance that confidentiality was observed and data collected was to be used for research purposes only. The researcher obtained an informed consent from every respondent and all the relevant authorities were consulted. The researcher sought permission to collect all the necessary data required.

RESULTS AND DISCUSSIONS

This chapter comprises of data analysis, findings and interpretation. Results are presented in tables and diagrams. The analyzed data was arranged under themes that reflect the research objectives. The number of questionnaires that were administered was 385. A total of 385 questionnaires were properly filled and returned. This represented an overall successful response rate of 92.5% as shown on table 1. According to Mugenda and Mugenda (2003) and also Kothari (2004) a response rate of 50% is adequate for a descriptive study. Babbie (2004) also asserted that return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good.

Demographic characteristics

This section consists of information that describes basic characteristics such as age of respondents, level of education, size of land under coffee and years they have practiced agriculture.

Gender of the respondents

The respondents were asked to indicate their gender. Majority of the respondents were male who were represented 55% of the sample while 45% were female. Figure 2 shows the results.

Membership of cooperative society

The respondents were asked to indicate whether they

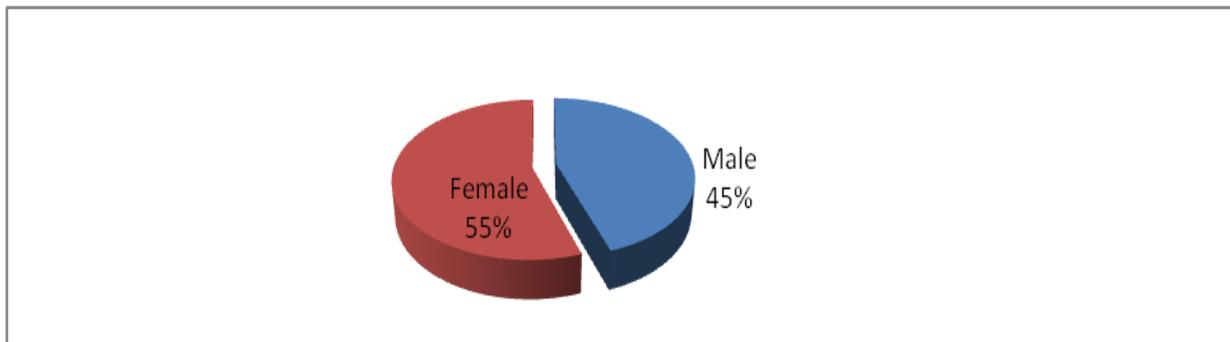


Figure 2: Gender of respondents

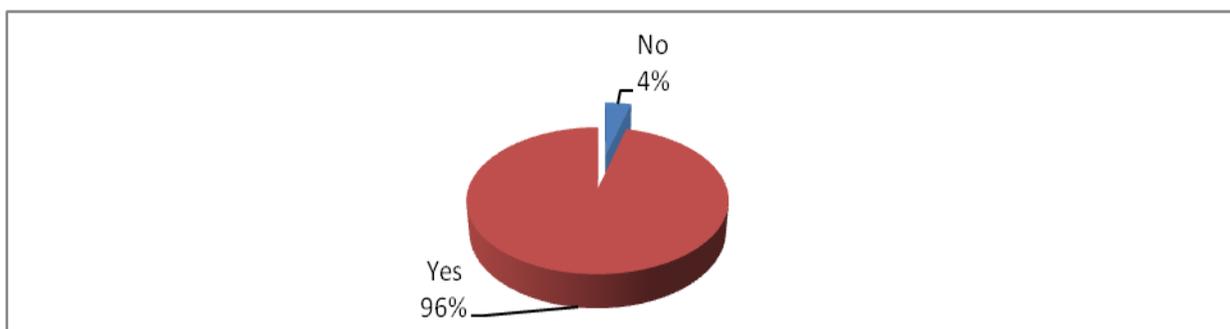


Figure 3: Members of Cooperative Society

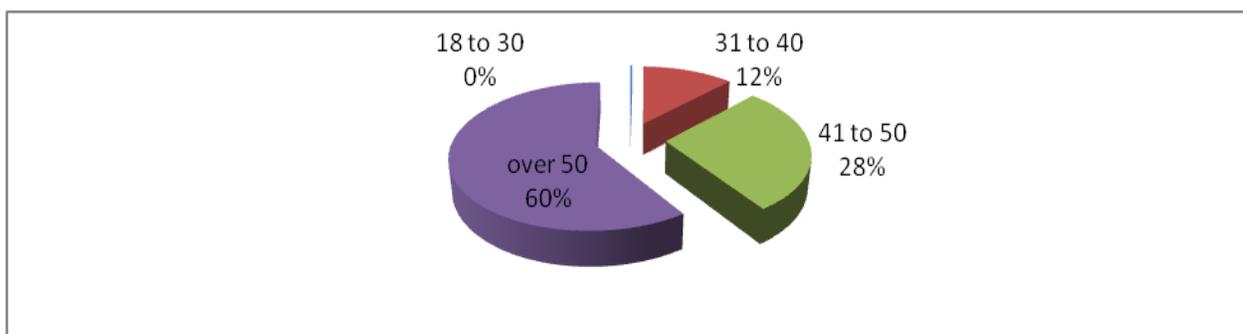


Figure 4: Age of the respondents

were members of a cooperative society or not. Result in figure 4.2 shows that 96% of the respondents were members of cooperative societies while 4% were not members of the cooperative society as shown in the figure 3.

Age of the respondents

The respondents were asked to indicate their age bracket. Results in figure 4 shows that 60% of the respondents were over 50 years, 28% were between 41 to 50 years, 12% of the respondents were between 31 years to 40 years this indicate that those who were the

majority were above 50 years.

Education level of the respondents

The respondents were asked to state their highest levels of education. Results in figure 5 show that majority represented by 43% of the respondents had secondary qualifications, followed by primary level with 34% of the respondents while 6% of the respondents were certificate level and 6% of the respondents were diploma level while 7% and 1% of the respondents had bachelor's degree and masters respectively. This implies that majority of the respondents have a secondary education level as shown in figure 5.

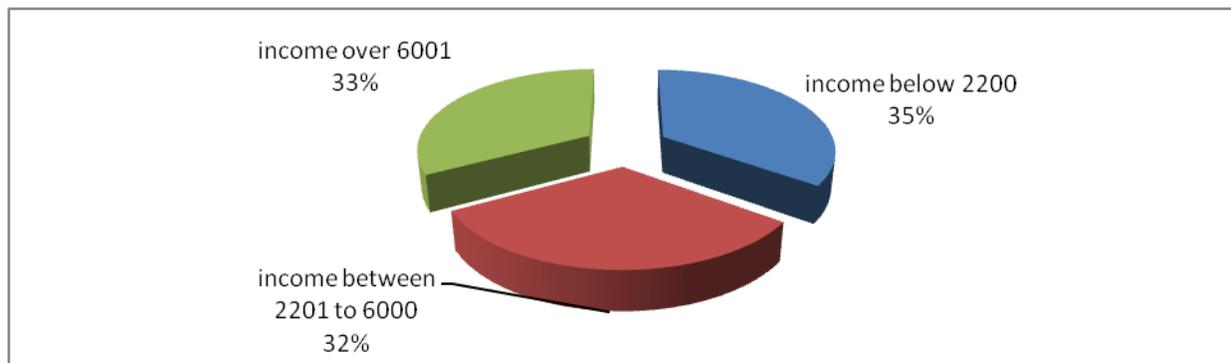


Figure 6: Income generated from coffee farming

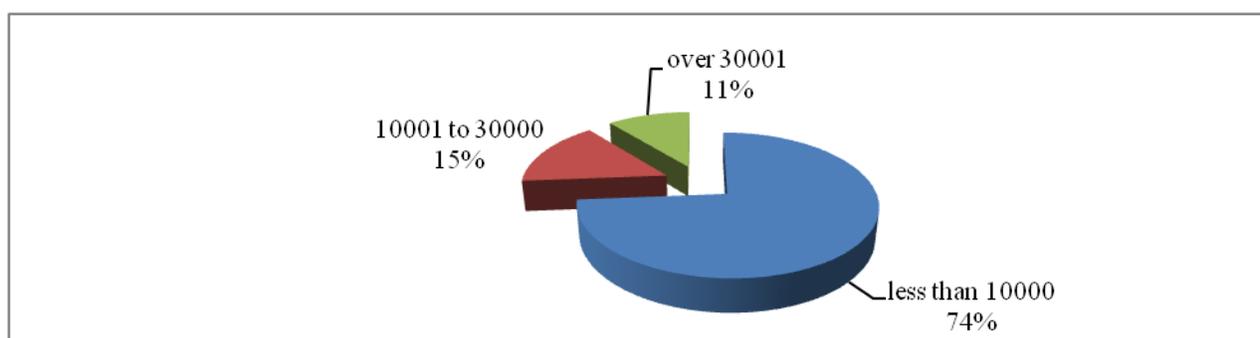


Figure 7: Income Generated from Other Activities

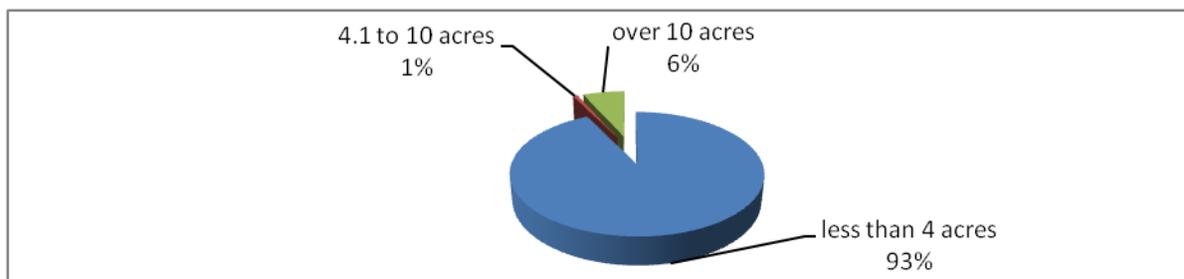


Figure 8: Land under Coffee

Monthly income of respondents

The respondents were asked to indicate their monthly income generated from coffee farming. Results in figure 6 show that 35% of the respondents earned below ksh. 2200 while 33% of the respondents earned income of over ksh. 6001 while 32% represented respondents who earned between ksh. 2201 to 6000 this implies that majority of the respondents generated an income of below 2200 from coffee farming as shown in figure 6.

Income come from other activities

The respondents were also asked to indicate the income they generated from other activities other than coffee

farming. Results in figure 7 show that majority (74%) of the respondents were earning less than 10000 while 33% of the respondents earned income between 10001 and 30000 while 11% represented the respondents who earned over 30000 from other activities besides coffee farming.

Land under coffee

The respondents were asked to indicate the size of land under coffee. Results in figure 8 show that majority of the respondents represented by 93% had less than 4 acres under coffee while 1% of the respondents had between 4.1 and 10 acres of their land under coffee and finally 6%

Table 2: Descriptive results of quality of coffee

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	mean	St. Dev
The grade of coffee is affected by the changes in weather which leads to low performance of coffee industry	0.50%	28.00%	23.2%	26.0%	22.2%	3.41	1.13
Overutilization of soil without Further improvement leads to lower taste of coffee and this leads to low performance	0.30%	4.00%	56.3%	29.5%	9.80%	3.95	0.73
Over-fermentation of coffee during peak season affects the final taste and flavor of coffee and this leads to low performance	0.00%	10.40%	21.0%	42.5%	26.1%	4.84	0.92
Lack of resources to brand local coffee lowers the selling price due to the poor quality and thus leads to low performance	5.60%	17.70%	21.5%	37.6%	17.7%	4.04	1.13
Reliance on sun drying leads to a poor quality of coffee thus fetching lower prices hence low performance	12.40%	44.20%	27.5%	9.10%	6.80%	2.54	1.04
Average						4.016	0.99

Table 3: Correlation results of quality of coffee

	Statistics	Quality of Coffee	Coffee Industry Performance
Quality Of Coffee	r-value	1	
	p-value		
	N	385	
Coffee Industry Performance	r-value	0.291*	1
	p-value	0.042	
	N	385	396

of the respondents had over 10 acres land under coffee. The study findings indicate that majority of the respondents were definitely not large scale coffee farmers as shown by the percentage of land under coffee. This can also be attributed to land fragmentation due to increase in population.

Descriptive results of quality of coffee

Majority of the respondents represented by 28% disagreed that quality of coffee is affected by weather changes which lead to low performance of coffee industry in Kenya. As to whether poor soils affect the quality of coffee, 56% of the respondents were neutral. This suggests that the respondents had mixed opinion as to whether quality of coffee is affected by poor soil and whether this can affect the performance of coffee industry in Kenya. The respondents were also asked whether over fermentation of coffee during the peak season affected the taste and flavour of coffee leading to low performance. Majority of the respondents represented by 42% agreed with this statement. Majority of the respondents (37%) were also in agreement that poor branding of local coffee as of low quality led to low performance of coffee industry in Kenya. Finally as to whether reliance on sun drying led to lowers coffee

quality hence affecting the selling price of coffee majority of the respondents (44.20%) disagreed does not necessarily lead to low performance of coffee industry. These results imply that quality of coffee produce locally had a relationship with the performance of coffee industry in Kenya. On a five point scale, the average mean of the responses was 4.016 which mean that majority of the respondents agreed to the statements in the questionnaire; however the answers were varied as shown by a standard deviation of 0.99 (table 2).

Correlation results for quality of coffee and coffee industry performance

The results presented in the table 3 shows that quality of coffee and performance of coffee industry have positive and significant association ($r=0.291$, $p=0.042$).

Regression results of quality of coffee and performance of coffee industry

The results presented in table 4 present the fitness of model used in regression to explain the study phenomena. Quality of coffee was found to be satisfactory variable in explaining coffee industry performance. This is supported by coefficient of determination also known as the R square of 28.0%. This

Table 4: Regression of coefficients

	Performance of coffee industry
Parameter Estimate	Coefficient(P value)
Constant	1.692 (0.001)
Quality of Coffee	0.155 (0.002)
R Squared	28.0
F statistic (ANOVA)	38.095 (0.000)

means that the above variable explained 28.0 % of the variations in the dependent variable which is performance of coffee industry in Kenya. This result further suggests that the model applied to link the relationship of the variables was satisfactory.

The results reveal that quality of coffee has impacted the performance of coffee industry in Kenya. Majority of the respondents agreed that the quality of coffee produced in Kenya is has affected the general performance of coffee industry in Kenya. This finding is further supported by the result of regression analysis carried out which shows that the quality of coffee produced have a significantly positive relationship with the performance of coffee industry in Kenya. From the regression analysis the study obtained a beta coefficient of 0.155 which suggests a positive and significant relation between the two variables. These results imply that to boost the performance of coffee industry in Kenya players in this industry should employ strategies that will increase the quality of coffee produced. These findings agree with those of Kirumba & Pinard (2010) and Mwangome (2011) who found out that performance of coffee sector depends on selling prices which are dictated by the quality of coffee.

CONCLUSION

Based on the findings above the study concluded that coffee industry performance requires a great deal of investment to raise the standards and maintain a vigorous industry. The study also concluded that the quality of coffee was among the key factors that must be addressed to keep the coffee industry alive. The grower's capacity was another limiting factor to expansion of coffee industry. The study therefore, concluded that lack of funds, knowledge in coffee farming and necessary farm inputs prevented full exploitation of coffee industry in Kenya.

Recommendation

The following recommendations based on the study findings are suggested to help boost performance of coffee industry in Kenya.

- Production of coffee from harvesting to processing should be done in the manner that will maintain the high quality of final coffee which will attract high prices hence revitalizing the coffee industry.
- CBK should also intervene to train farmers on how to

maintain healthy crops that will leads to high quality produce.

- Farmers should be highly paid which will motivate them to produce high quality coffee. High pay will act as incentive to farmers to expand their coffee production and also farmers will have enough funds necessary to purchase farm inputs leading to the growth of the coffee industry.

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