European Journal of
Business and Strategic Management
(EJBSM)

EFFECT OF FINAL PROCESSING PRACTICES CARRIED OUT BY THE COFFEE COOPERATIVE SOCIETIES ON THE SUSTAINABILITY OF THE COFFEE INDUSTRY IN KENYA

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

European Journal of Business and Strategic Management
ISSN 2518-265X (online)
Vol.2, Issue 8 No.4, pp 60 - 75, 2017

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING
www.iprjb.org

EFFECT OF FINAL PROCESSING PRACTICES CARRIED OUT BY THE COFFEE COOPERATIVE SOCIETIES ON THE SUSTAINABILITY OF THE COFFEE INDUSTRY IN KENYA

1*Regina Wambui Mwangi

PhD. student, Dedan Kimathi University of Technology Email

address: rw.mwangi2015@gmail.com

2* Dr. Anita Wanjugu Wachira

Senior Lecturer, Dedan Kimathi University of Technology

Email address: anita.wachira@dkut.ac.ke

3* Dr. Lilian Karimi Mugambi Mwenda

Senior Lecturer, Dedan Kimathi University of Technology

Email address: lilian.mwenda@dkut.ac.ke

4* Dr. David Kiarie Mburu

Senior Lecturer, Dedan Kimathi University of Technology

Email address: dmburu77@gmail.com

ABSTRACT

Purpose: The study sought to evaluate the effect of final processing practices carried out by the Coffee cooperative societies on the sustainability of the coffee industry in Kenya.

Methodology: The study adopted descriptive research design. From a target population of 525 coffee cooperative societies in the East and West of the Rift valley, a sample size of 295 coffee cooperative societies was drawn using stratified random sampling where the response rate was 82.71 percent. The chair persons were the key respondents. A cross sectional survey was conducted where the questionnaires were the main data collection. Collected data was analyzed using descriptive and inferential statistics.

Results: The results revealed that final processing practices and sustainability of the coffee industry are positively and significantly related. Using the regression of coefficient, final processing practices had a beta value of 0.264 with a *t-value* of 3.062 and p=0.002. Since p is <0.05, the null hypothesis was rejected at significant level of 0.05. This therefore implies that the final processing practices have a positive and significant effect on the sustainability of the coffee industry.

Unique contribution to theory, practice and policy: The RBV theory can be used to transform the Kenyan coffee industry as it engages in value addition thereby producing unique end products which are competitive. To be able to boost the sustainability of the coffee industry, the study recommends that the government and the relevant policy makers in the coffee industry should come up with a variety of incentives that would encourage the adoption of the coffee value addition practices by the coffee cooperative societies in Kenya.

Key words: *final processing practices, sustainability, coffee cooperative societies, coffee industry* **INTRODUCTION**

Porter (1980) defined value addition in the coffee value chain, as the difference between the sale price of an item and the cost of producing it. Coffee value chain consists of the movement of the raw materials from the suppliers to the final consumers. In value chain continuum there are several processes or steps towards achieving a final product. Ensign (2001) described value chain as value creating activities right from basic raw material, which is sourced from suppliers to when the end product is delivered to the final consumer. The coffee chain comprises of value adding practices engaged with the processing and marketing the coffee products. By engaging in value addition practices, a manufacturer enhances the value of a product by giving it new features and or components which attract higher premiums. Value addition practices include several processes or steps towards achieving a final product. Eathington, Swenson and Otto (2000) stressed on the need of following all the steps in the value addition process. By skipping a step in the processing, the final product cannot be achieved and the steps must also occur in the proper order.

Kenya is a significant coffee producer but plays a marginal role in the advanced stages of value addition with coffee growers receiving only about 6-7% of the coffee cup retail price. Kenya has a history of selling raw green coffee which has a relatively low market value owing to the very limited value addition practices or none at all in the coffee cooperative societies (EPC, 2015). The majority of value addition practices through processing, branding and distribution of coffee products to the consumers occur within the consuming regions (Acet, 2009). As a consequence the prices have been quite low, with farmers resulting to other viable ventures not to mention the uprooting of the coffee bushes (Gathura, 2013). The low earnings forces coffee farmers to push the factors of production past a healthy threshold which does not favor sustainable coffee business. This traditional approach of selling raw green coffee may however, not be sustainable in the present highly competitive age. The continued sale of raw coffee produce is not viable thus not sustainable. In today's era the coffee cooperative societies need to strategically adopt value addition practices especially in the final processing stage which include roasting, packaging and branding. This would enhance their competitiveness both locally and at the global scene thereby increasing the sustainability of the coffee industry in Kenya. Productivity gains would be higher if coffee value addition practices such as final processing practices are carried out within the Kenyan borders (Chege, 2012). Coffee value addition involves enhancement of coffee thereby attracting premium prices for the small scale coffee farmers. Value addition practices and particularly at the final processing stage should be enhanced and be the cornerstone upon which the coffee cooperative societies are conceptualized.

Value addition practices have been adopted elsewhere and with great returns, such as in Brazil and Ethiopia who have successfully become substantial players in coffee final processing at the global scene (Acet, 2009). Cote d'lvoire and Tanzania have also engaged in the final coffee processing for the domestic market. It is important to note that in Africa, several value adding opportunities exist such as the development of origin branding for coffees. In this regard Ethiopia has been instrumental, playing a leading role in value addition practices .This has proved that coffee value

addition is a viable engagement (Acet, 2009) and needs to be promoted in the Kenyan coffee industry.

Padin and Svensson (2013) contended that sustainability is a dynamic continuum, and can be best achieved as an ongoing process rather than a static achievement requiring flexibility and adaptation. According to Kegonde (2005), in order to achieve sustainability, long-term environmental, social and economic needs must be met and in an integrated coherent manner but without compromising the ability of future generations to meet their own needs. Sustainability in the coffee sector according to ICO (2015) referred to the approaches of assessing the well-being of the coffee farmers as well as good environment conservation policies that promote social equity. A sustainable coffee industry is thus anchored on the well-being of the various actors in the coffee value chain. A sustainable coffee farmer therefore should be able to favorably compete effectively while meeting the long term environmental, social goals, and enhancing profit margins. The sustainability of the coffee sector depends on the three pillars: economic, environmental and social sustainability.

Problem Statement

The Kenyan coffee sub sector, which was a steady and reliable source of livelihood for millions of the small scale coffee farmers and which enjoyed national prominence as the biggest foreign exchange earner faces many challenges. These challenges are manifested in the steady decline in coffee production from 128,700 Metric Tonnes in 1987/1988 to 39,800 Metric Tonnes by 2013/2014; this decline has reduced Kenya's position in coffee production from 12th to 24th worldwide. The earnings of the coffee growers have drastically reduced to the level where only about 6-7 per cent of the retail price accruing to the coffee cup gets to the coffee farmers. The result has been manifested in the diversification and abandonment of the coffee farms and uprooting of the coffee bushes in the extreme cases. Despite the many reforms carried out by the government to streamline the coffee sub sector since 1986, the situation is still on a downward trend. Kenya continues to play a marginal role in the advanced stages of coffee processing, such as the final processing practices by continuing to sell raw green coffee. This raises the question, "Is marketing of green coffee tenable for a sustainable coffee industry in Kenya?" There is need for Kenya to increase the gross margins of the small scale coffee farmers to boost the sustainability of the coffee industry. The coffee cooperative societies need to embrace the value addition practices, which if adopted would transform and adapt them to the dynamics of the sustainable coffee industry. This would in turn enhance their competitiveness. Documentation of previous studies on value addition analysis in coffee sector in Kenya had focused mainly on the analysis of the activities, value that was created on each stage and the profit distribution of the value chain actors. None of these studies has focused on the final processing practices in the coffee cooperative societies and sustainability of the coffee industry in Kenya. Therefore, this study focused on the effect of final processing practices carried out by the coffee cooperative societies on the sustainability of the coffee industry in Kenya.

Objective of the Study

The main objective of the study was to evaluate the effect of final processing practices carried out by the coffee cooperative societies on the sustainability of the coffee industry in Kenya.

Theoretical Framework Resource Based Theory

Resource Based Theory (RBT) was articulated by Penrose (1959). The theory highlights the importance of an organization in building and combining valuable set of resources together in unique and dynamic ways with the intention of attaining firm success. Firms compete based on their resources and capabilities. Resources can either be tangible or intangible. While tangible are property-based, the intangible refer to the knowledge based resources (Peteraf & Barney, 2003) which are ways in which firms combine and transform the tangible inputs. The firm develops competitive advantage by acquiring and developing its physical, human and organizational resources in ways that add unique value and are difficult for competitors to imitate (Barney, 1991). The RBT theory affirmed the Value Chain Model where value was added to the product at every stage as it moved along the coffee value chain. This process required physical, human and organizational resources that add unique rare, valuable, inimitable and difficult to replicate products.

The central beliefs of RBT as suggested by scholars among them (Barney, 1991) are that heterogeneity of the firms' resources which are also valuable, rare, non-substitutable and imperfectly inimitable form the basis of a firms' sustained competitive advantage. There has been criticism of whether the RBT is applicable to supply chains, however this criticism has only fueled support for utilizing the RBT within the supply chains with Barney (2012) supporting and suggesting that RBT is a competitive weapon when used in the strategic management.

This view is further supported by Versei, Soosay, Fahimnia and Sarkis (2014) who posit that every firm has its own assets, capabilities, processes, competences and knowledge that are unique to it and valuable. This study in agreeing with the proponents of this theory suggests that the coffee industry is bound to succeed and attain sustainability through the adopting of value addition practice in the coffee cooperative societies. This will be through the accumulation of these rare, valuable, inimitable and difficult to replicate products. Coffee roasters and retailers are the major actors in the coffee value chain and are said to capture the larger profits while famers are left at the lower end. This view has been supported by Kamau (2015) who observes that the farmers have been reduced into *'impotent'* producers with no say on pricing of their crop.

In this study, the RBT was used to evaluate the coffee value addition practices in Kenyan coffee cooperative societies. The coffee cooperative societies have different manufacturing capabilities and competences; managers, employees and other stakeholders who have expertise in knowhow concerning the value addition practices. In the context of final coffee processing, this study proposes that the coffee cooperative societies should apply strategic resources and capabilities to create rare valuable, inimitable and difficult to replicate products. For example, Kenya which produces 'specialty coffee' engages in strategic processing of the coffee from primary to final processing stages could earn a premium which will lead to sustainable coffee industry. The motive behind adopting value addition practices is to enhance the sustainability of the coffee in Kenya by creating rare and valuable products that are difficult to imitate.

Empirical Literature Review

Coffee roasting is a process that produces the characteristic flavor of coffee by transforming the raw green coffee beans into roasted coffee beans. This involves heating the roasters from below and tumbling the green coffee beans in a current of hot gases. This process results to expanded beans that have changed the color, taste, smell, and density and is a sophisticated and highly skilled processing activity. Green coffee beans are roasted for a period of time ranging from 3 to 30 minutes at temperatures of between 370 and 540 °F (188 and 282 °C) by using natural gas, liquefied petroleum gas (LPG) or electricity. Following roasting, the beans are cooled using a vacuum system and stabilized i.e. degassing. In the Kenyan scene the steps are as described; however there are variations depending with the country. After roasting coffee beans are then ground and or packaged for transport. Appropriate packaging can increase the shelf life of coffee to approximately one year (Acet, 2009).

Kenya exports raw coffee to the large commercial roasters who prefer to roast it in facilities close to the final consumption markets. They also blend coffees from various origins before roasting according to the consumption market (Chege, 2012; Acet, 2009). Coffee roasters have increasingly gained control of the marketing chain in recent years, despite the strong competition from other players in the chain. The largest roasters process almost 40% of all the coffee that is consumed worldwide with the individual shares ranging from 1% to more than 10%. These large players trade 50% of the world green coffee beans and they include Neumann Kaffee Gruppe (Germany), Volcafe (Switzerland) and Ecom (Switzerland) (Panhuysen & Pierrot, 2014). Acet (2009) pointed out that it is economically feasible to roast coffee through cost-competitive roasting close to origin, thereby adding value within the country hence higher returns. Karanja and Nyoro (2002) argued that the share of gross value added as a percentage of retail prices of roasted coffee in most importing countries is over 70 per cent. Kenya is known for its high quality Arabica coffee and therefore can substantially gain from her coffee exports by engaging in the final processing activities. However, there is need for Kenyan firms to increase their capacity for domestic final processing, considering that only few coffee cooperative societies are licensed to process coffee to consumption (Chege, 2012).

RESEARCH METHODOLOGY

Based on the positivism research philosophy, the study adopted descriptive research design. From a target population of 525 coffee cooperative societies in the East and West of the Rift valley, a sample size of 295 coffee cooperative societies was drawn using stratified random sampling where the response rate was 82.71 percent. The chair persons were the key respondents. A cross sectional survey was conducted where the self-administered questionnaire was the main data collection instrument and was subjected to both the reliability and validity tests. Collected data was analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSIONS Descriptive Statistics Coffee Roasting

The study sought to find out how the coffee roasting in the coffee cooperative societies was being carried out. The results were presented in a pie chart as depicted in Figure 1.

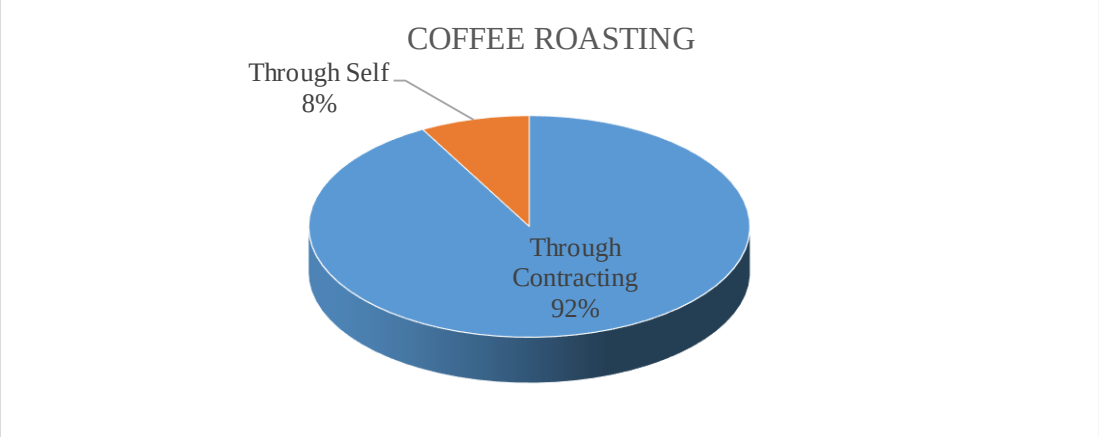

Figure 1 Coffee Roasting

Figure 1 indicates that, out of the coffee cooperative societies who engage in coffee roasting, 92% contracted coffee roasters who have the machineries for roasting and only 8% of them roasted their own coffee. The study findings do clearly reveal that if Kenyan coffee cooperative societies could engage in value addition practices such as coffee roasting locally the gross share of earnings would drastically increase.

Amount of Clean Coffee Roasted from 2011/2012 to 2015/2016 Crop Years

The study sought to find out the amount of clean coffee roasted by the coffee cooperative societies between 2011/2012 to 2015/2016 crop years. The results are presented as in Table 1.

Table 1 Amount of Clean Coffee Roasted

Crop year	Less than 1000 Kgs	1000 - 5000 Kgs	5000 - 10000 Kgs	10000 - 15000 Kgs	More than 15000 Kgs
2011/2012	49.40%	15.60%	11.70%	2.60%	20.80%
2012/2013	45.30%	20.00%	9.30%	4.00%	21.30%
2013/2014	44.70%	21.10%	10.50%	3.90%	19.70%
2014/2015	44.90%	15.40%	15.40%	5.10%	19.20%
2015/2016	43.60%	19.20%	14.10%	2.60%	20.50%

From Table 1, the findings are very clear that the majority of the coffee cooperative societies had roasted less than 1000 kilograms of clean coffee between the crop years 2011/12-2015/16 while on the other hand very few coffee cooperative societies had roasted more than 15,000 kilograms of clean coffee between the crop years 2011/12-2015/16. It is evident that very few coffee cooperative societies have engaged in the value addition practices and especially final processing of coffee. The findings of this study support earlier findings that coffee in Kenya is largely sold in its raw form due to the very limited value addition practices or none at all in the coffee cooperative societies. This is due to the very few coffee cooperative societies that are licensed to process coffee to final consumption. These attract low coffee prices in the market largely impacting on the sustainability of the coffee industry. In addition, if coffee is roasted close to the origin, Kenya

could substantially gain from her coffee exports by engaging in the final processing activities, hence higher returns which could lead to sustainability of the coffee industry.

Final Processing Practices and Sustainability of the Coffee Industry

When coffee cooperative societies engaged in final processing of their coffee, they stand to gain the largest share of value in the coffee value chain. The final processing explanatory variables used in this study were; roasting and packaging.

The study sought to establish the extent to which the coffee final processing practices influence sustainability of the Kenyan coffee industry. These practices were measured via a Likert scale of 5 to 1 (5 = strongly agree, 4 = agree, 3 = Neutral, 2 = disagree and 1 = strongly disagree). The mean response rates and the Standard Deviations from the coffee cooperative societies were calculated.

Table 2 Final Processing Practices and Sustainability

Statement	5	4	3	2	1	Mean	Std. Dev
The cooperative society has invested on training of employees on roasting coffee in an effort to boost sustainability	7 (2.8%)	47 (19.3%)	15 (6.4%)	72 (29.4%)	103 (42.2%)	2.11	1.23
The cooperative society has invested heavily on training of employees on packaging coffee so as to boost sustainability	11 (4.6%)	33 (13.8%)	20 (8.3%)	90 (36.7%)	90 (36.7%)	2.13	1.19
The cooperative society has invested on good machinery for roasting coffee in an effort to boost sustainability	11 (4.6%)	38 (15.6%)	18 (7.3%)	63 (25.7%)	114 (46.8%)	2.06	1.26
The cooperative society has improved the livelihoods of the small scale farmers through appropriate packaging of coffee in an effort to boost sustainability	9 (3.7%)	45 (18.3%)	22 (9.2%)	72 (29.4%)	96 (39.4%)	2.17	1.24
The cooperative society uses biodegradable packaging material to manage waste	7 (2.8%)	23 (9.4%)	34 (14.2%)	83 (34%)	97 (39.6%)	2.02	1.09
The cooperative society has adopted environmentally friendly coffee packaging methods	9 (3.7%)	48 (19.4%)	34 (13.9%)	63 (25.9%)	90 (37%)	2.27	1.25
The cooperative society has adopted packaging made of recyclable materials enhancing quality of products	0 (0%)	38 (15.6%)	40 (16.5%)	70 (28.4%)	96 (39.4%)	2.08	1.09

The cooperative society supports the adoption of product branding to ensure higher final price by the end user	30 (12%)	45 (18.5%)	20 (8.3%)	52 (21.3%)	97 (39.8%)	2.42	1.47
Average						**2.16**	**1.23**

According to the results in Table 2, it is evident that most of the coffee cooperative societies do not engage in the value addition final processing practices such as roasting, branding and packaging. Only a small proportion engages in these value addition practices. This has consequently affected their competitiveness in the coffee industry hence affecting their sustainability since their final product (raw green coffee) is not able to attract the premium prices.

Challenges of the Final Processing of Coffee

The study sought to establish the challenges faced in final processing of coffee. The results are as summarized in Table 3 according to the coffee growing regions.

Table 3 Challenges of Final Processing of Coffee

Region	Emerging Themes	Comment
Western	Lack of transparency in information; Lack of licenses	Majority of coffee cooperative societies in Western region lacked transparency in information about roasting and packaging and licenses
Rift Valley	Lack of machineries; Lack of licenses	Majority of coffee cooperative societies in Rift Valley region lacked machineries for final processing and licenses
Nyanza	Lack of machineries; Lack of licenses	Majority of coffee cooperative societies in Nyanza region lacked machineries for final processing and licenses
Eastern	Lack of machineries; Lack of training; Lack of space for machineries; Lack of licenses	Majority of coffee cooperative societies in Eastern region lacked machineries for final processing, adequate training on final processing and licenses
Central	Lack of knowledge; Lack of machineries; Lack of space for machineries; Theft ; Lack of licenses	Majority of coffee cooperative societies in Central region lacked adequate knowledge on final processing, space for installing the machineries, licenses and some feared theft cases

Strategies to Overcome the Challenges of Final Processing of Coffee

The study further sought to explore the strategies adopted by the coffee cooperative societies in a bid to overcome the challenges faced in the final processing of coffee. Table 4 summarizes the respondents' responses according to the coffee growing regions.

Table 4 Strategies to Overcome Final Processing Challenges

Region	Emerging Themes	Comment
Western	Enhancing transparency	Majority of coffee cooperative societies in Western region were enhancing transparency in information about coffee roasting and packaging
Rift Valley	Joining coffee Unions	Majority of coffee cooperative societies in Rift Valley region have put strategies of joining the union that have already engaged with the final processing activities
Nyanza	Apply for licenses; Training	Majority of coffee cooperative societies in Nyanza region have put strategies on trainings on about the final processing practices
Eastern	Training; Buying machineries; Remove middlemen; Buying more land	Majority of coffee cooperative societies in Eastern region have adopted training strategies to adopt final processing practices, some were ready to purchase some machinery for roasting coffee, buying more land to accommodate final processing practices and eliminating the middle men in the value chain.
Central	Training; Buying more land; Educating employees; Security	Majority of coffee cooperative societies in Central region have adopted training strategies to be able to adopt coffee roasting and packaging, buying more land to accommodate final processing practices and improving their security in their coffee cooperative societies.

As depicted in Table 4 the majority of the coffee cooperative societies in the Western region were vouching for transparency with regard to information on coffee roasting and packaging; while in Rift Valley region, majority of the coffee cooperative societies were joining the coffee Unions which were already engaged in the final processing practices in order to counter the challenges of the final processing practices. In addition, majority of the coffee cooperative societies in the Nyanza and Eastern regions had sought for the grower marketer licenses in a bid to engage in final processing activities; and also engaged in the trainings that would enable them understand what final processing practices entailed. Further, some of the coffee cooperative societies in the Eastern and Central regions engaged in strategies of purchasing more land, purchasing roasting machineries and removing the middle men in order to overcome the challenges faced in the final processing practices.

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING
www.iprjb.org

Correlation Analysis of Final Processing Practices on Sustainability of the Coffee Industry in Kenya

Using Pearson's moment correlation analysis, the extent to which the test items of final processing practices on sustainability of the coffee industry in Kenya was established. The results were as presented in Table 5.

Table 5 Correlation Analysis of Final Processing Practices

		Sustainability	training roasting	training packing	roast machinery	improve lives	biodegradable	packaging	recyclable materials	adopt branding
Sustainability	Pearson Correlation	1								
	Sig. (2-tailed)									
training on roasting	Pearson Correlation	.361*	1							
	Sig. (2tailed)	**.033**								
training on packaging	Pearson Correlation	.276**	.499**	1						
	Sig. (2tailed)	**.000**	0							
roasting machinery	Pearson Correlation	.471*	.704**	.464**	1					
	Sig. (2tailed)	**.021**	0	0						
improved livelihood	Pearson Correlation	.286**	.440**	.304**	.396**	1				
	Sig. (2tailed)	**.000**	0	0	0					
biodegradable	Pearson Correlation	.139	.705**	.427**	.721**	.411**	1			
	Sig. (2tailed)	0.31	0	0	0	0				
friendly packaging	Pearson Correlation	.283	.542**	.316**	.577**	.237**	.655**	1		
	Sig. (2tailed)	.08	0	0	0	0	0			

recyclable materials	Pearson Correlation	.085	.654**	.476**	.774**	.375**	.767**	.624**	1	
	Sig. (2tailed)	.187	0	0	0	0	0	0		
Adopting branding	Pearson Correlation	.671**	.605**	.437**	.722**	.422**	.724**	.577**	.727**	1
	Sig. (2- **.009**	0	0 tailed)		0	0	0	0	0	

*** Correlation is significant at the 0.05 level (2-tailed).**
**** Correlation is significant at the 0.01 level (2-tailed).**

The results in Table 5 revealed that investing on training employees on roasting coffee and sustainability are positively and significantly related (r=0.361, p=0.033). There was a weak positive relationship between investing on training employees on roasting coffee and sustainability. The results also revealed that investing heavily on training of employees on packaging coffee and sustainability are positively and significantly related (r=0.276, p=000). The investing heavily on training of employees on packaging coffee and sustainability showed a weak positive relationship. The results also indicated that investing on good machinery for roasting coffee and sustainability are positively and significantly related (r=0.471, p=0.021). The investing on good machinery for roasting coffee and sustainability showed a moderate positive relationship. The results also showed that improving livelihoods of the small scale coffee farmers through appropriate coffee packaging and sustainability are positively and significantly related (r=0.286, p=0.000). These results showed a weak positive relationship between improving livelihoods of the small scale coffee farmers through appropriate coffee packaging and sustainability. The results also showed that adoption of product branding and sustainability are positively and significantly related (r=0.671, p=0.009). There was a strong positive relationship between adoption of product branding and sustainability. However use of bio-degradable packaging material to manage waste(r=0.139, p=0.31), adoption of environmentally friendly coffee packaging methods (r=0.283, p=0.08) and adoption of packaging made of recyclable material (r=0.085, p=0.187) did not have any influence the sustainability of the coffee industry in Kenya.

Regression Analysis for Final Processing Practices

The objective of the study was to evaluate the effect of final processing practices carried out by the coffee cooperative societies on the sustainability of the coffee industry in Kenya. Regression analysis was used to examine whether final processing practices can be used to explain sustainability of the coffee industry.

Table 6 Model Fitness for Final Processing Practices

Variables	Coefficients
R	**0.482**
R^2	**0.232**
Adjusted R^2	**0.205**

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING
www.iprjb.org

Std. Error of the Estimate	**1.26848**

Final processing practices were found to be satisfactory in explaining sustainability of the coffee industry. This is supported by coefficient of determination also known as the R^2 of 0.232. This means that the model fitness found out that final processing practices explain 23.2% of the variations in the dependent variable which is sustainability of coffee industry.

Table 7 Analysis of Variance for Final Processing Practices

	Sum of Squares	df	Mean Square	F	Sig.
Regression	111.802	8	13.975	8.754	**0.000**
Residual	375.161	235	1.596		
Total	486.963	243			

Table 7 provides the results of the analysis of the variance (ANOVA). The results indicate that the model was statistically significant. Further, the results imply that the independent variable is a good predictor of sustainability. This was supported by an F statistic of 8.754 and the reported pvalue (0.000) which was less than the conventional probability of 0.05significance level. Regression of coefficient results of final processing practices was presented in Table 8.

Table 8 Regression of Coefficients for Final Processing Practices

	B	Std. Error	t	Sig.
(Constant)	2.013	0.193	10.427	0.000
training of employees on roasting coffee(FP1)	0.171	0.147	-1.163	**0.006**
training of employees on packaging coffee (FP2)	0.295	0.073	4.03	**0.00**
good machinery for roasting coffee (FP3)	0.395	0.156	0.607	**0.004**
improving the livelihoods of the small scale farmers(FP4)	0.336	0.076	4.423	**0.000**
using bio-degradable packaging material to manage waste(FP5)	-0.181	0.172	-1.052	0.294
environmentally friendly coffee packaging methods(FP6)	0.463	0.09	5.134	0.221
packaging made of recyclable materials(FP7)	-0.465	0.171	-2.722	0.107
adoption of product branding(FP8)	0.991	0.117	0.011	**0.001**

Regression of coefficients showed that training of employees on roasting of coffee and sustainability had a positive and significant relationship (r=0.171, p=0.006). The results also showed that training of employees on packaging coffee and sustainability had a positive and significant relationship (r=0.295, p=0.00). The results also revealed that good machinery for roasting coffee and sustainability had a positive and significant relationship (r=0.395, p=0.004). The results also revealed that improving the livelihoods of the small scale farmers and sustainability had a positive and significant relationship (r=-0.336, p=0.004). The results also revealed that adoption of product branding and sustainability had a positive and significant relationship (r=0.991, p=0.001). The aggregate mean score of final processing practices was regressed against sustainability index to give the optimal model for final processing practices. The results were as presented in Table 9.

Table 9 Optimal Regression Model for Final Processing Practices

	B	Std. Error	T	Sig.
(Constant)	2.274	0.193	11.787	0
Final Processing Practices	0.430	0.104	4.151	**0.000**

Regression of coefficients showed that final processing practices and sustainability of the coffee industry had a positive and significant relationship (r=0.430, p=0.000). The results thus do indicate that the equation for establishing whether final processing practices has a statistically significant effect on sustainability of the coffee industry was:

$$S = 2.274 + 0.43\ FP + \varepsilon$$

S - Sustainability of the coffee industry
FP - Final Processing practices ε -
error term

This model shows that when coffee cooperative societies engage in final processing practices, it would lead to a 43% increase in sustainability of the coffee industry.

The impact of final processing practices on sustainability of the coffee industry is thus statistically significant at a significant level of $p<0.05$, t=4.151. This means that there is a statistically significant relationship between the computed final processing practices and sustainability of the coffee industry

Hypothesis testing for final processing practices was done.

The third Hypothesis to be tested was:

H_{01}: There is no effect of final processing practices carried out by the coffee cooperative societies on the sustainability of the coffee industry in Kenya.

Table 10 Hypothesis Testing for Final Processing Practices

	Sum of Squares	df	Mean Square	F	Sig.
Regression	32.361	1	32.361	17.227	0
Residual	454.602	242	1.879		
Total	486.963	243			

The hypothesis was tested by using simple linear regression (Table 10). The acceptance/rejection criteria was that, if the p value is greater than 0.05, the H_{01} is not rejected. The null hypothesis was that there is no relationship between final processing practices and sustainability of the coffee industry in Kenya. Results in Table 10 show that the *p*-value was 0.000, while F statistics was 17.227. This indicated that the null hypothesis that there is no effect of final processing practices carried out by the coffee cooperative societies on the sustainability of the coffee industry in Kenya was rejected.

Summary of Findings

To achieve this objective the respondents indicated their level of agreement to various final processing practices particularly in coffee roasting and packaging. The study hypothesized that there was no statistically significant relationship between final processing practices and sustainability of the coffee industry. The results revealed that final processing practices and sustainability of the coffee industry are positively and significantly related. Using the regression of coefficient, final processing practices had a beta value of 0.264 with a *t-value* of 3.062 and p=0.002. Since p is <0.05, the null hypothesis was rejected at significant level of 0.05. This therefore implies that the final processing practices have a positive and significant effect on the sustainability of the coffee industry.

Conclusion

Based on the research findings, the study concluded that there was a significant positive effect of the final processing practices and sustainability of the coffee industry. Holding all other factors constant, the final processing practices contribute 26.4% towards sustainability of the coffee industry with a *p-value* of 0.002. Higher final price by the end user was achieved when coffee cooperative societies adopt product branding (with a beta value of 0.991) which implied higher gross margins of the small scale coffee farmers which enhanced sustainability of the coffee industry. The study concluded that not many coffee cooperative societies had adopted the product branding, something that needs to be addressed through the government coffee regulators. The coffee cooperative societies that have engaged in appropriate packaging of their coffee products (with a beta value of 0.336 and *p-value* of 0.000) have improved the livelihoods of the small scale coffee farmers. The study also concluded that the coffee cooperative societies that have invested on good machinery for roasting coffee (with a beta value of 0.395), on training of employees on packaging coffee (with a beta value of 0.295) and on training of employees on roasting coffee (with a beta value of 0.171) improved the sustainability of the coffee industry. In conclusion, if the coffee cooperative societies engage in functional upgrading, they improve their own position and also secure their position within the coffee value chain. In this way, the smallholder farmers can improve their competitiveness in the global market thus improving their livelihood.

Recommendations of the Study

From the study findings, it is evident that there are very few coffee cooperative societies which have engaged in the value addition practices. To be able to boost the sustainability of the coffee industry, the study recommends that the government and the relevant policy makers in the coffee industry should come up with a variety of incentives that would encourage the adoption of the coffee value addition practices by the coffee cooperative societies in Kenya.

REFERENCES

ACET, (2009). *The coffee value-addition opportunity in Africa*. A report from African Center for Economic Transformation. Retrieved from oldacet.deanpaulcollins. com/wp-content / uploads /2014 /08 / Coffee-Dalberg

Barney, J. (2012). Purchasing, supply chain management and sustain competitive advantage: the relevance of source-based theory. *Journal of Supply Chain Management, 48*(2), 3-6.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Chege, J. (2012). Value addition in coffee industry in Kenya: Lessons from cut flower sector. Kenya Institute for Public Policy Research and Analysis (KIPPRA) Nairobi, Kenya. (ICBE-RF Research Report No. 21/12). Retrieved from https://ideas.repec. org/d/kipprke.html

Eathington, L., Swenson, D. & Otto, D. M. (2000). *Employment Growth in Iowa's Agricultural Commodity Processing Industries.* 1992-98, Iowa State University, Iowa. Retrieved from http://EconPapers.repec.org/RePEc:isu: genres: 4011.

Ensign, P. C. (2001). Value chain analysis and competitive advantage: Assessing strategic linkages and interrelationships. *Journal of General Management, 27*(1), 18-42.

Gathura, M. N. (2013). Factor affecting small- scale coffee production in Githunguri District, Kenya. *International Journal of Academic Research in Business and Social Sciences, 3*(9), 2222-6990.

I.C.O. (2015). *Sustainability of the coffee sector in Africa.* Retrieved from www.ico.org/documents/cy2014-15/icc-114-5e-overview-coffee-sector-africa.pdf

Kamau, J. (2015). How ruthless coffee mafia enslaves Kenya. *Daily Nation,* pp. 1- 2, 16-24.

Karanja, A. M. & Nyoro, J. K. (2002). Coffee prices and regulation and their impact on livelihood of rural community in Kenya. *Journal of Agriculture, Food systems and Community Development, 1*(1), 49-64.

Kegode, P. (2005). *Economic Governance of Coffee Sector- Focus Central Province.* Report Submitted to Center for Governance and Development. Retrieved from https://www.coursehero.com › ... › BUSINESS T › BUSINESS T 250

Padin, C. & Svensson, G. (2013). A multi-layer matrix model of sustainable tourism: Process, measurement areas, gap and reconnection analysis. *European Business Review, 25*(2), 206216.

Panhuysen, S & Pierrot, J. (2014). *Coffee Barometer*. A coffee Report by Hivos, IUCN Nederland, Oxfam Novib, Solidaridad, WWF. Retrieved from https://www.scribd.com/document/326192265/Coffee-Barometer-2014-Report-1

Penrose, E. T. (1959). *The Theory of the growth of the firm*. New York: John Wiley.

Peteraf, M. & Barney, J. (2003). Unravelling the Resource-Based Tangle. *Managerial and Decision Economics, 24,* 309-323.

Porter, M. E. (1980). *Competitive Strategy*. New York: Free press.

Versei, M., Soosay, C., Fahimnia, B. & Sarkis, J. (2014). Framing sustainability performance of supply chain with multidimensional indicators. *Supply Chain Management: An International Journal, 19*(3), 242-257