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## **FINANCIAL FACTORS AFFECTING COFFEE PRODUCTION AMONG SMALL SCALE FARMERS IN KIAMBU COUNTY, KENYA**

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**Abstract:** *Coffee farming is an important economic activity in Kenya due to its contribution in creation of employment and earning of foreign exchange. Coffee production has been on a declining trend since 1987/88 when a record of 130,000 metric tons of clean coffee was produced compared to about 36, 000 metric tonnes in 2015/16. In comparison, tea production, which is the other major cash-crop in Kenya, has been on the rise with its production increasing from 293,000 metric tonnes in 2003 to 378,000 metric tonnes in 2015. Although there exists more profitable ventures such as real estate in some of the coffee growing areas, some coffee farmers are still willing to continue with coffee farming. To mitigate on the declining coffee sector in Kenya, the government has undertaken a number of measures aimed at reviving the industry. However, despite these measures, the acreage under coffee and the general production of coffee continues to decline with some small holders abandoning production of the crop. The land under coffee in Kiambu County has gradually reduced from around 80,000 acres in 1980s to 45,000 acres at present due to coffee farmers engaging in real estate projects and other more profitable ventures. The foundation of the study was based on Resource Based theory and Churchill and Lewis Firm growth theory.*

**Significance:** *The findings of this study were intended to provide vital information on why it is necessary for the Government of Kenya to offer cheap and vital financial assistance to the small scale coffee farmers in order to revitalize the declining coffee production in Kenya.*

**Findings:** *The research established that limited access to credit and high cost of coffee production were the financial factors that affected small scale farmers during the production stage while delay in coffee payments affected the small scale farmers during the marketing stage. The future of the Kenyan coffee industry depends on how well these issues are addressed. By building the capacity of smallholders through extension services, improved seedlings, finance, and sustainable payment in coffee farming, there can be a reverse in the coffee production trend.*

**Keywords:** *agricultural service, income level of farmers, smallholder farmer*

### **1. Introduction**

Coffee is one of the most important commodities in terms of value traded globally, and plays a crucial role in the livelihoods of millions of rural households across the developing world. In addition to the estimated 25 million small scale coffee farmers who depend directly on coffee as their primary source of income, coffee contributes significantly to foreign exchange earnings and plays a leading role in

determining opportunities for employment and infrastructure development in more than 50 developing countries (International Coffee Organization ICO, 2013).

## 2. Coffee Industry in Kenya

Kenya is recognized worldwide due to its excellent coffee which command high price in the world market. Coffee sector in Kenya is ranked fourth in contribution to GDP after tourism, tea and horticulture and over 600,000-700,000 smallholders are engaged in coffee production (Mugwe, 2014).

Kenya mainly grows Arabica coffee which accounts for almost 98% of its national production. Robusta is also grown but accounts for less than 1% of the country's production (Gituma, 2012). While small farms are said to average 1 to 5 acres, land inheritance practices that require the division of land between offspring each generation has resulted in much smaller farms in some and threatens to make coffee farming unsustainable as a livelihood. The small holders are organised into cooperatives so as to sell their coffee together while the estates sell their coffee individually. Kenyan coffee is sold using the auction system. Initially there were two bodies that were dealing with coffee farmers namely Coffee Marketing Board (CMB) and Coffee Board (CB) which were merged in 1971 to become (CBK) Coffee Board of Kenya (Aksoy, 2012).

Coffee production has been on a declining trend since 1987/88 when a record of 130,000 metric tons of clean coffee was produced compared to 1990s, country's production of 77,514 metric tons on average of clean coffee which is 40% less than what was being produced in 1987/88 and the decline in production is more pronounced in smallholder farms where it declined by 47% during the same period. In 2002, the industry contributed about 3.2% of Kenya's foreign exchange earnings, a drop from the 40% contribution in the late 1980s, with the production levels at 55,000 metric tons (Njuru, 2013). The dismal performance of coffee industry resulted in job losses and reduced incomes to families relying on coffee for their livelihood. The decline in coffee production was attributed to fluctuations in world prices, production practices used by farmers, pests and diseases and lack of credit to purchase inputs like fertilizers (EPZA, 2005).

In comparison, tea production, which is the other major cash-crop in Kenya, has been on the rise. Tea is now the country's leading foreign exchange earner, with export earnings standing at about Kshs 110 billion in 2015, up from Kshs 33 billion in 2003, a 230 per cent increase. Tea output accounts for about 11 per cent of agriculture's share of Kenya's Gross Domestic Product (GDP). The area under tea farming in Kenya has also increased from 131,000 hectares in 2003 to 188,000 hectares, while production has increased from 293,000 metric tonnes to 378,000 metric tonnes in 2015 (Ministry of Agriculture, 2015).

Before coffee milling was liberalized in 1995, KPCU was the only sole coffee miller in the country having been started by white colonial farmers in 1937. The mill, owned by farmers through their respective co-operative societies, had a milling capacity of over 150,000 metric tons (Gathura, 2013). The liberalization of the coffee sector in 1995 by Government led to the issuance of milling licenses to NKG Coffee Mills, Socfinaf Ltd, Thika Coffee Mills (TCM) and Gatatha Coffee Mills. The coffee "wars" of 1998/99 was a result of rivalry among coffee millers competing for a share of the limited milling business. As a result, the infighting forced many societies to split as members disagreed over the choice of millers to engage leading to disillusionment of farmers and decline in production (Gathura, 2013). Kenya produces almost exclusively washed Arabica coffee of the Bourbon type

although there is a small scale production of Robusta coffee that is grown in the low attitude areas. Kenya is the 6<sup>th</sup> largest coffee producer in Africa and the 18<sup>th</sup> in the world. Kenya produced 36,000 tonnes of coffee in 2015/2016 down from 39,825 in 2013/2014, due to the erratic El Nino weather conditions and declining interest by small scale coffee farmers (Business Daily, 2016).

Kiambu County is located in central Kenya and it was once among the leading coffee producing areas in Kenya characterized by large and small scale coffee farming. Coffee growing is mainly carried out in central region of Kiambu County. The administrative divisions comprises of Kiambaa, Kikuyu and Githunguri which lead in coffee production in the county. High population density in most parts of the county has led to fragmentation of land into small pieces resulting in a decline in coffee productivity (ICO, 2013).

Coffee production in Kiambu just like everywhere else in Kenya continues to face numerous challenges including; increasing cost of labour and inputs, erratic weather conditions, high incidences of pests and diseases, competition from other farm enterprises among others (Coffee Annual Report, 2016). The decline in coffee production has greatly affected Kiambu County where the traditionally large scale coffee farms have continuously been converted into real estate business due to pressure from the expansion of Nairobi city. For the small scale coffee farmers, lack of capital from financial institutions, poverty, high cost of coffee production, land demarcation, competition from horticultural crops among other attributes dampens the effort to revive the coffee farming. Gathura (2013) summarized the financial constraints facing the declining coffee farming in Kiambu County by observing that, there is a strong correlation between finances and coffee production.

### **3. Statement of the Problem**

Despite measures undertaken by the Kenya government and the improvement in coffee prices, the acreage under coffee and the general production of coffee continues to decline with small holders abandoning production of the crop (Njuru, 2013). Comparatively, the area under tea farming (the other major cash crop) in Kenya has increased from 131,000 hectares in 2003 to 188,000 hectares, while production has increased from 293,000 metric tonnes to 378,000 metric tonnes (Ministry of Agriculture, 2015). Further, the Ministry of Agriculture (2015) statistics showed that coffee production in Kenya has fallen from about 130,000 metric tonnes in 1989 to about 36,000 metric tonnes in 2015. Income from coffee has grown down from \$500 million to \$150 million in 2015. The land under coffee in Kiambu County has gradually reduced from around 80,000 acres in 1980s to present 45,000 acres due to coffee farmers engaging in other more profitable ventures like real estate. The real estate business is very profitable in Kiambu County due to the influx of people in the County influenced by the proximity to Nairobi which is the Capital City and also due to industries and institutions in the County (ICO, 2013). To worsen the matter further, some coffee farmers have of late uprooted their crops leading to an increasing decline in quantity of coffee production (Coffee Research Foundation, 2008). According to Gathura (2013), ignoring the coffee sector will have a negative impact on the economy of Kiambu County. It will further fuel poverty among the small holder farmers. The collapse of the coffee economy, especially in Central Kenya, is partly responsible for the growth of dangerous criminal gangs such as Mungiki which promise young people an exciting, lucrative though shortlived livelihood (Daily Nation, 24<sup>th</sup> June, 2016).

Many factors have affected coffee production in Kenya but few researchers have focused on the financial factors affecting coffee production and from the view point of small holder farmers. Most

scholars have focused on the role of coffee co-operatives societies (Njuru, 2013; Kamau, 2014). This study filled the gap by examining the financial factors affecting coffee production among small scale farmers.

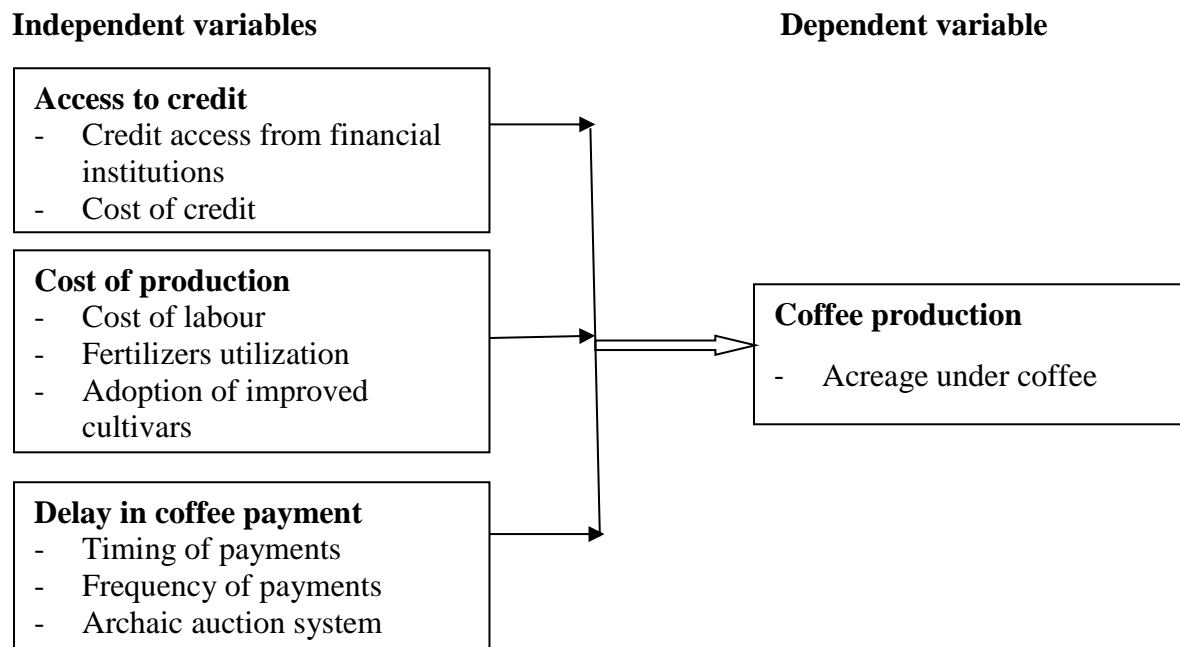
#### 4. Study Objectives

The general objective of this research was to examine the financial factors affecting coffee production among small scale farmers in Kiambu County. The Specific Objectives of the study were to;

1. To assess the influence of access to credit on coffee production among small scale farmers in Kiambu County
2. To establish the influence of cost of production on coffee production among small scale farmers in Kiambu County.
3. To examine the influence of delay in coffee payments on coffee production among small scale farmers in Kiambu County.

#### 5. Conceptual Framework

Based on the relationship between the independent and dependent variables, the conceptual framework is as illustrated on figure 1.



**Figure 1 Conceptual framework**

#### 6. Research Methodology

This study employed a descriptive survey research design. The population of the study comprised of 30,379 small scale coffee farmers with an average acreage of 0.36 ha in Kiambu County. A sample size calculator yielded a sample size of 380 respondents. Proportionate stratified sampling was used to obtain the representative sample for the 380 farmers. This study used one set of self-administered questionnaires for small scale coffee farmers as the main tool for collecting the data. The study employed descriptive and inferential statistical methods in data analysis. The multiple regression

model was utilized to further give inferences to the data obtained using the Statistical Package for Social Sciences (SPSS). Data presentation was in form of tables that helped to interpret the findings and generate conclusions.

## 7. Research Findings And Discussion

### Coffee Production

The respondents were asked to indicate the number of kilograms of coffee they had produced for the last two years. Majority of the respondents, 53% indicated that they have produced between 200kgs-299.9kgs in 2014/2015 and 51% produced 100kgs-199.9kgs in 2015/2016. The study concluded that there was a decline in the coffee production in 2015/2016 relative to 2014/2015. The results have been summarised in the table 1 below.

**Table 1 Coffee production**

Item	2014/2015	Percentage	2015/2016	Percentage
1kg-99.9 kgs	20	8%	23	9%
100kgs-199.9kgs	44	18%	127	51%
200kgs-299.9kgs	132	53%	73	29%
300kgs-399.9kgs	38	15%	16	6%
400 and above	16	6%	11	5%
<b>Totals</b>	<b>250</b>	<b>100%</b>	<b>250</b>	<b>100%</b>

Coffee production is highly dependent on specific rainfall distribution patterns. Rainfall distribution directly controls effective flowering of coffee bushes, cherry maturation and determines the prevalence of diseases. Prolonged drought experienced during the year 2015/16 led to reduction in coffee volumes.

### Factors that Affect Coffee Production in the Sub County

The respondents were asked to indicate the factors that affect coffee production in the sub county. 70% of the respondents agreed that limited access to credit has contributed to decline in coffee production since farmers were unable to meet periodic expenses. High cost of farm inputs has also contributed to the decline of coffee production. The rainfall patterns together with excessive droughts experienced during the year, made crop management and disease control to be expensive and as a result, it affected the yield. Low prices of coffee affected the morale to produce quality coffee since at the coffee co-operatives, coffees from different growers were mixed and farmers earned the same amount with those who didn't pay attention to their crops. The rest of the results have been summarized on the table 2 below.

**Table 2 Factors affecting coffee production in the sub counties**

Factors	Mean agreement on 1-5 point likert scale	Percentage agreement
Limited access to credit	2.80	70
High cost of borrowing	2.12	53
High requirement by banks for security	2.00	50
High cost of farm inputs	2.60	65

Requirement for a license before establishment of coffee farm	1.60	40
Climatic changes	2.52	63
Low price of coffee	2.60	65
Use of poor coffee production technology	2.52	63
<b>Totals</b>	<b>2.35</b>	<b>59</b>

### Measures to Address the Decline in Coffee Production.

The respondents were asked to indicate the measures that can be taken to address the issue of decline in coffee production. 90% of the respondents stated accessibility of affordable loans. The rest of the results have been summarized on the table 3 below.

**Table 3 Measures to address the decline in coffee production.**

<b>Factors</b>	<b>Mean agreement on 1-5 point likert scale</b>	<b>Percentage agreement</b>
Accessibility of affordable coffee loans	3.60	90
Training on value addition in the coffee production process	2.00	50
Improvement of road networks	2.00	50
Delivering of inputs, and extension services to the farmers	2.72	68
Encouraging a policy reform in coffee sector	2.60	65
Provision of favourable factors to farmers has helped improve coffee yield	2.40	60
Direct and timely payment systems of coffee	3.40	85
<b>Totals</b>	<b>2.68</b>	<b>67</b>

The study established that high quality coffee production requires a lot of purchased farm inputs such as fertilizers and pesticides. These inputs require finances which are not forthcoming due to delayed payments. Accessibility of affordable loans will enable farmers to meet periodic farm expenses.

### Access to Credit

The researcher sought to find out the sources of funding, access to credit from financial institutions and cost of credit.

### Source of Funding

Respondents were asked to state the sources of the funding they use to run their farm. Majority of the respondent (80%) stated credit from coffee factory as the main source of the funding. However, minority of the respondents stated credit from bank as the source of the funding they use to run their farm. About 80% of the farmers have membership to co-operatives while 20% manage the coffee farms on their own. The reason behind this large number is that farmers are offered services such as marketing of their produce, loan services and extension services. The results have been summarized on the table 4 below.

**Table 4: Source of funding**

Source of fund	Frequencies	Percentage
Personal savings	30	12%
Credit from friends	15	6%
Credit from coffee factory	200	80%
Credit from MFI	0	0%
Credit from bank	5	2%
<b>Total</b>	<b>250</b>	<b>100%</b>

### Credit Access from Financial Institutions

The researcher sought to find out the availability of credit facilities and whether small scale farmers could access credit from financial institutions in Kiambu county. The results have been summarized on the table 5 below.

**Table 5 Availability of credit facilities**

Category	Frequency	Percentage
Yes	240	96
No	10	4
<b>Total</b>	<b>250</b>	<b>100</b>

The study revealed that Kiambu county has a relatively well developed financial system and there are many financial institutions. However, only a few financial institutions advance credit to farmers due to risks associated with farming business. The study revealed that many small farmers operate their businesses informally and do not have records or financial information that banks require for lending.

### Cost of Credit

The researcher sought to find out factors that impeded access of funding from the credit facilities. The results have been summarized on the table 6 below.

**Table 6 Factors that impeded access to funding from credit facilities**

Factors	Mean agreement on 1-5 point likert scale	Percentage agreement
Lack of farm records	2.40	60
Lack of collateral	3.60	90
High transaction costs	2.80	70
Distance to the lending institutions	0.40	10
High interest rates	3.20	80
<b>Totals</b>	<b>2.48</b>	<b>62</b>

The study revealed that financial institutions are hesitant to lend money to small scale coffee farmers directly due to limited security. Banks also charge very high interest rates despite the large number of financial institutions in the county.

### Cost of Coffee Production

The researcher sought to assess the cost of labour, fertilizers utilisation and adoption of improved cultivars.

#### Cost of Labour

The respondents were asked to indicate the sources of labour for the coffee farm. Activities performed in coffee farms included: weeding, pruning, fertilizer and insecticides application and harvesting of coffee. Majority of the respondents (64%) indicated family labour as the source of labour for the coffee farm. The results have been summarized on the table 7 below.

**Table 7 Sources of labour for the coffee farm**

Sources of Labour	Frequencies	Percentage
Own self	20	8%
Family labour	160	64%
Hired labour	70	28%
<b>Total</b>	<b>250</b>	<b>100%</b>

The study revealed that coffee farming is labour intensive. Most of small scale farmers indicated that they experienced difficulties in paying good rates to attract workers during peak seasons and as a result they relied on family labour.

#### Fertilizers Utilization

The researcher sought to find out whether the farmers were using the recommended fertilizers for coffee production. Fertilizer requirement of coffee is dependent on soil fertility and level of production. The commonly used fertilizers were CAN and NPK. Use of proper type of fertilizer ensured nutrients were available for use of the crop when needed. Due to high cost of purchased inputs, small scale farmers preferred to use manure which provided the essentials but in limited amount. Usage of fertilizers by small scale farmers is indicated in table 8 below.

**Table 8: Fertilizers utilization**

Type of fertilizer	Frequencies	Percentage
CAN	50	20%
NPK 22:6:12+TE	12	5%
NPK 17:17:17	13	5%
Manure	175	70%
<b>Total</b>	<b>250</b>	<b>100%</b>

The study established that high costs of fertilizers have led to reduction in application of these inputs, resulting in delivery of low quality coffee.

#### Adoption of improved cultivars

The respondents were asked to indicate the level of adoption of coffee improved cultivars which are resistant to diseases as an indicator of low cost of production. The results have been summarized on the table below.



**Table 9 Adoption of improved cultivars**

Type of fertilizer	Frequencies	Percentage
SL 28	175	70%
SL 34	55	22%
Ruiru 11	13	5%
Batian	7	3%
<b>Total</b>	<b>250</b>	<b>100%</b>

The study revealed that most small scale farmers have planted SL 28 and SL 34 which are not resistant to major coffee diseases of leaf rust and coffee berry diseases.

### Farm Profits

Concerning the question if the respondents were able to make profit after incurring the production costs, majority of the respondents (70%) did not agree with the notion.

**Table 10 Farm profits**

Respondents	Frequencies	Percentage
Yes	75	30%
No	175	70%
<b>Total</b>	<b>250</b>	<b>100%</b>

The study revealed that smallholder farmers harvest 2 kg of coffee per tree on average compared to large plantations who obtain a yield of 8 kg of coffee per tree attributed to limited uptake of recent technology and insufficient use of fertilizers and pesticides due to high costs. With the current auction prices of 4 US dollar per kg (200 US dollar per 50kg bag) on average, and related costs such inputs supply, loan servicing costs, coffee processing and marketing charges deducted from the coffee proceeds, the farmer's earnings is reduced. Therefore, there is need for farmers to have cost-effective ways to improve productivity per tree so that they can increase their profit margin in relation to coffee prices.

### Aspects Related to Cost of Production

The respondents were also asked to indicate their agreement with the aspects related to cost of production. 95% of the respondents noted that coffee production costs have escalated due to increase in the cost of purchased farm inputs. The results have been summarized below.

**Table 11 Aspects related to cost of coffee production**

Factors	Mean agreement on 1-5 point likert scale	Percentage agreement
Labour costs in coffee represent more than 70% of the total production cost.	1.80	45
Coffee production costs have escalated due to increase in the cost of purchased farm inputs.	3.80	95

Poor road infrastructures contribute to cost of input due high transport cost.	2.40	60
The increases in cost of coffee production lead to decline in coffee prices.	2.00	50
Market forces in coffee have caused depressed prices resulting from excess costs of production.	2.80	70
Decreasing profit margins have made smallholder farmers to produce less coffee.	3.60	90
High cost of production leads to poor economic conditions of the coffee farmers.	2.20	55
<b>Totals</b>	<b>2.64</b>	<b>66</b>

The study revealed that poor road infrastructures have significantly contributed to cost of inputs due to high transport cost.

### Delay in Coffee Payments

The researcher sought to find out the duration coffee farmers were waiting to be paid after delivering their produce to their cooperative society and whether the timing of payments and archaic auction system affected coffee production.

### Payment Duration

The study sought to understand the experienced delay in payment of coffee proceeds from co-operative societies. The results have been summarized in the table 12.

**Table 12 Delay in coffee proceeds payment**

Respondents	Frequencies	Percentage
Yes	220	88%
No	30	12%
<b>Total</b>	<b>250</b>	<b>100%</b>

Majority of the respondents indicated that the payment duration was between 6 months to 12 months. The delay in payment has made it difficult for farmers to meet periodic expenses and as a result forfeit input application and farm operations which in turn influence yield and quality of coffee.

### Timing of Payments

The respondents were also asked to indicate whether timing of coffee payments affected the coffee production. 90% of the respondents indicated that it has compromised the quality of coffee and management of coffee in the farms. The results have been summarized on the table below.

**Table 13 Effect of uncertainty in timing of Coffee Payments**

Factors	Mean agreement on 1-5 point likert scale	Percentage agreement
Farmers are forced to intercrop coffee with other food crops to loss of income	avoid 1.60	40
Farmers have turned into dairy farming.	2.00	50

Some farmers have uprooted the coffee plants due to frustrations by delays and loss of money.	caused	2.80	70
The delay has compromised the quality of coffee and management of coffee in the farms.	of	3.60	90
Some farmers have sold their coffee farms and ventured into real estate.	estate.	3.20	80
<b>Totals</b>		<b>2.64</b>	<b>66</b>

### Archaic Auction System

The respondents were also asked to indicate whether the current auction system affects coffee production. 90% of the respondents agreed that it affects coffee production. The current auction system limits small scale farmers to access coffee market directly since by law, they are required to appoint a marketing agent who pools the coffee of many farmers and act for them on annual contracts. The marketing agent charges them a commission for market advisory services which reduces their earnings. Before the farmer receives the coffee proceeds, the marketing agent deducts advances and related charges owed to the cooperative societies, a process that leads to delay in payments. The results have been summarised below:

**Table 14 Effect of the Current Auction System on Coffee Production**

Respondents	Frequencies	Percentage
Yes	225	90%
No	25	10%
<b>Total</b>	<b>250</b>	<b>100%</b>

The study also revealed that, with the current auction system the farmers have the least amount of bargaining power within the value chain and rely on the information provided by the marketing agent. Limited information on markets and changing dynamics of consumers' needs implies that the farmer has little participation in coffee value chain and this affects coffee production.

### Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables and coffee production among small scale farmers in Kiambu County. The researcher used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions.

**Table 15 Model Summary**

Model	R	R Square	Adjusted R Square	STD error of the Estimate
1	0.89	0.77	0.70	0.75

R-Squared is a commonly used statistic to evaluate model fit. R-square is 1 minus the ratio of residual variability. The adjusted R-Squared, also called the coefficient of multiple determinations, is the percentage of the variance in the dependent explained uniquely or jointly by the independent variables. 70% of the changes in the coffee production among small scale farmers could be attributed to the combined effect of the predictor variables.

**Table 16: Summary of One-Way ANOVA results**

Model		Sum of Square	Df	Mean Square	F	Sig
1	Regression	9.20	4	2.30	9.20	0.0001
	Residual	40.80	46	0.24		
	Total	50.10	50			

The probability value of 0.0001 indicates that the regression relationship was highly significant in predicting how access to credit, cost of production and delay in coffee payments influenced coffee production among small scale farmers in Kiambu County. The F calculated at 5% level of significance was 9.20 since F calculated is greater than the F critical (value =2.5252), this shows that the overall model was significant.

**Table 17: Regression coefficients**

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	T	Sig
1	(Constant)	1.055	0.216		4.84	0.000251
	Access to credit	0.687	0.150	0.620	4.59	0.000303
	Cost of production	-0.765	0.092	0.137	8.20	0.00022
	Delay in coffee payment	-0.750	0.090	0.136	8.37	0.00040

As per Table 17, the equation  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$  become:

$$Y = 1.055 + 0.687X_1 - 0.765X_2 - 0.750X_3$$

Where Y is the dependent variable Production of coffee

X1 - Access to credit

X2 - Cost of production

X3 - Delay in coffee payment

The regression equation above has established that taking all factors into account (access to credit, cost of production and delay in coffee payment) constant at zero production of coffee among small scale farmers will be 1.055. The findings presented also show that taking all other independent variables at zero, a unit increase in the access to credit would lead to a 0.687 increase in the scores of production of coffee among small scale farmers. Further, the findings shows that a unit increases in the scores of cost of production would lead to a 0.765 decrease in the scores of production of coffee among small scale farmers. The study also found that a unit increase in the scores of delay in coffee payment would lead to a 0.750 decrease in the scores of production of coffee among small scale farmers. All the variables were significant ( $p < 0.05$ ).

### **Regression result of variables**

The variable access to credit has a positive effect on coffee production. Since most of the coffee farmers experience delays in coffee payments, access to credit will enable them to meet periodic expenses in coffee production.

Cost of production affects coffee production negatively. High cost of inputs has led to reduced application of these inputs resulting to production of low quality coffee which fetch low prices in the market and this lead to reduction in coffee production. Delay in coffee payment also has a negative effect on coffee production since it has made many farmers forfeit input application and farm operations which in turn influence yield and quality of coffee. The uncertainty in timing of payment has made some farmers to sell part of their coffee farm and ventured into real estate and some to intercrop coffee with other food crops to avoid loss of income.

### **8. Summary of Major Findings**

The study sought to establish the financial factors affecting coffee production among small scale farmers in Kiambu county. A total of 380 questionnaires were administered and the study managed to obtain 250 completed questionnaires representing 66% response rate. The questionnaires contained questions that addressed the objectives of the study.

#### **Coffee Production**

The study established that majority of the respondents produced between 200kgs-299.9kgs of coffee in 2014/2015 and 100kgs-199.9kgs in 2015/2016. This implies that there has been decline in the coffee production in 2015/2016 relative to 2014/2015. Furthermore, the study noted that limited access to credit was the key factor that contributed to decline in coffee production in the sub counties since most of the coffee farmers have faced difficulties to meet periodic expenses in coffee production.

#### **Access to Credit**

The study established that the main source of the funding among small scale farmers was credit from coffee factory. Many small farmers operate their businesses informally and do not have records or financial information that banks require for lending. The study revealed that Kiambu county has a relatively well developed financial system and there were many financial institutions but they are hesitant to lend money to small scale coffee farmers directly due to limited security. Banks also charge very high interest rates despite the large number of credit providers in the county.

#### **Cost of Coffee Production**

The study established that coffee farming is labour intensive and majority of the respondents experienced difficulties in paying good rates to attract workers during peak seasons and as a result they relied on family labour. The study revealed that farmers with low income use less input which in turn influence yield and quality of coffee. It was noted that poor road infrastructures have significantly contributed to cost of inputs due to high transport cost. The study also revealed that most of the small scale farmers have planted SL 28 and SL 34 which are not resistant to major coffee diseases of leaf rust and coffee berry diseases.

## **Delay in Coffee Payments**

The study established that majority of the respondents experience delay in payment of coffee proceeds from coffee co-operative societies. The delay in payment has made it difficult for farmers to meet periodic expenses and as a result forfeit input application and farm operations which in turn influence yield and quality of coffee. The study also revealed that the current auction system limits small scale farmers to access coffee market directly since by law, they are required to appoint a marketing agent. Before the farmer receives the coffee proceeds, the marketing agent deducts advances and related charges owed to the cooperative societies, a process that leads to delay in payments.

## **9. Conclusions**

The study sought to establish the extent to which access to credit, cost of production and delay in coffee payments influence coffee production among small scale farmers in Kiambu County. The study made the following conclusions:

### **Coffee Production**

The study concluded that there have been decline in the coffee production in 2015/2016 relative to 2014/2015. The key factor that contributed to that decline of coffee production is limited access to credit. Most of the coffee farmers have faced difficulties to meet periodic expenses in coffee production and as a result reduced inputs application which has contributed to poor yields.

### **Access to Credit**

The study concluded that credit from coffee factory was the main source of the funding among small scale farmers. Most of the small farmers operated their businesses informally and do not have records or financial information that banks require for lending. The study also concluded that banks charge very high interest rates despite the large number of credit providers in the county and lack of collateral and farm records were the major factors that hindered small scale farmers to access to funding from financial institutions.

### **Cost of Coffee Production**

The study concluded that fertilizers and pesticides were the most critical factors in determining coffee production costs. Farmers with low income use less inputs which in turn influence yield and quality of coffee. The study further concluded that the key aspect related to cost of coffee production among small scale farmers is that costs of production have escalated due to increase in the cost of purchased farm inputs. Poor road infrastructure is the main factor behind the increase of these costs of purchased farm inputs.

### **Delay in Coffee Payment**

The study concluded that there were delays in payment of coffee proceeds from coffee co-operative societies. The delay in payment has made it difficult for farmers to meet periodic expenses and as a result forfeit input application and farm operations which in turn influence yield and quality of coffee. Uncertainty in the timing of the farmers' remuneration has made some farmers to sell part of their coffee farm and ventured into real estate and some to intercrop coffee with other food crops to avoid loss of income.

## **10. Recommendations**

The study findings yielded the following recommendations in view of the financial factors affecting coffee production among small scale farmers in Kiambu County.

The study found out that most of the small scale farmers who have access to credit have membership in coffee co-operative societies. Very few small scale farmers in Kiambu County have access to credit from banks due to lack of collateral, high interest rates, lack of farm records. The study therefore recommends that the Government should implement a loan programme with a convenient repayment system.

The Ministry of Agriculture should promote adoption of improved cultivars which are more yielding than traditional varieties and pest and disease resistant. This includes Ruiru II and batian cultivars. This will improve yield and quality and make the enterprise more profitable.

To ensure high return for the produce, the County Government should come up with farm input subsidy programme and also ensures the inputs are supplied to farmers timely. This will be through improving of transport and communication infrastructure. The Ministry of Agriculture staff should sensitize farmers through trainings in order to ensure proper utilization of inputs. To ensure adherence to the standard, the factory management should put up surveillance systems on crop management.

The Government should also increase manpower by hiring more agricultural extension workers and agronomists. Coffee co-operatives should introduce a capacity building programme in which farmers are taken through seminars on good coffee agricultural practices.

To guarantee sustained payment in coffee farming, it is important for the government and stakeholders to seek alternative sources for market that offer better payment in time. This can help to oversee challenges of delay in coffee payments. To ensure coffee market sustainability, the government needs to increase local consumption through campaigns and also promotion of coffee value addition through investing in processing of the coffee to ensure it is available to the locals and in many forms.

## **11. Areas for Further Research**

The study looked at financial factors affecting coffee production among small scale farmers in Kiambu County, another study on influence of social and economic factors on coffee production in the same area can be done. Also, future research should include larger sample size to analyze the in-depth relationship. Finally the future study should also consider carrying out the research on factors influencing technical efficiency on smallholder coffee production in Kiambu County.

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