FACTORS AFFECTING SMALL SCALE COFFEE PRODUCTION IN BUKOMANSIMBI DISTRICT:

A CASE STUDY OF KIBINGE SUB-COUNTY

BY

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NOVEMBER, 2017
DECLARATION

I, SSEKIDDE ELLY MWANJE, declare that, to the best of my knowledge, this dissertation is my original work and has neither been submitted to nor published by this university or any other institution of higher learning for the award of a degree or any other academic award.

..........................................................  27/11/2017

SSEKIDDE ELLY MWANJE

Date
This research report has been done under my supervision and is now ready for submission to the College of Business and management Sciences with my approval.

....................................................

27/11/2017

....................................................

Date

MR DOUGLAS A. CANDIA.
(SUPERVISOR)
DEDICATION

I dedicate this work to my loving parents Mr. Mwanje Reuben and Mrs. Jane Mwanje who have supported me morally and financially throughout my course and my entire life.

Special thanks to my supervisor Mr. Douglas A. Candia for the time he accorded unto me during this study.

I also dedicate this work to my friends and course-mates more so Ahabwe Andrew for being there for me throughout the entire stay at the university.
ACKNOWLEDGEMENTS

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Am greatly indebted to Mr. Lwanga Isaac, LC.V councilor of Butenga, Bukomansimbi district for his constructive guidance, time and the company he provided to me while in the field collecting data. It would have been really impossible to have this research accomplished without your great indispensable support.

Many thanks go to Mr. Mwanje Reuben for the financial support he provided that enabled me complete this research.

Above all, I am grateful to God the Almighty, for having enabled me accomplish this research.
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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA- Analysis of Variance

CWD- Coffee Wilt Disease

ICO- International Coffee Organization

MY-Marketing Year

UCDA- Uganda coffee Development Authority

UNCTAD- United Nations Conference on Trade and Development
ABSTRACT

The aim of this study was to determine the factors affecting small scale coffee production in Bukomansimbi district and analysis was done using primary data obtained by interviewing the farmers about the 2016/17 harvesting season and review of relevant literature. Our dependent variable was level of coffee output and our independent variables were the farmer’s sex, level of education, household size, and level of income, credit accessibility and farm size.

Data analysis was done using STATA. Pie charts and frequency tables were used for the univariate analysis, Analysis of Variance and Spearman’s rank correlation for the bivariate analysis and multiple linear regression for the multivariate analysis.

The results showed a significant positive relationship between the farmer’s household size, level of income, farm size and the level of coffee output. This was backed by evidence from other related studies.

Based on these findings, the researcher recommended that projects be set up to train farmers on other non-farm activities in order to increase their non-farm income and also the need for reliable and sustainable land reforms in order to enhance productivity.
CHAPTER ONE

INTRODUCTION

1.0 Introduction
The chapter consists of the introduction of the study. It outlines the background information on global coffee production, its challenges and its economic importance. Several socio-economic and institutional factors that influence coffee production are also discussed. The chapter further discusses the statement of the problem, objectives, the justification of the study, scope of the study and conceptual framework.

1.1 Background of the study
Coffee is an important cash crop in Uganda, with more than a million households linked to production of the crop that helps many people around the world get daily living. Uganda today is one of the leading African and international coffee producer and exporter. It is Africa’s second largest producer of coffee after Ethiopia and the fourth largest world exporter of Robusta Coffee in the world (Ponte, 2002). Ugandan economy has over time developed and improved, and coffee remains of vigorous importance earning an average of 60% of Agricultural annual export revenues for Uganda. It is projected that as much as 20% of the total population earn all or a large part of their cash income from coffee and its value chain activities. Coffee contributed on average 60% of Uganda’s foreign exchange earnings and did so until in the year 2002 when its contribution fell to a mere 25%. This rapid fall, brought about social and economic imbalances in many smallholder Ugandan coffee farmers affecting their daily livelihoods. For many of these coffee farmers, coffee meant not only money in their pockets but it also translated into ability to afford education, health care, food security and improved household standards of living. Since the 1980s, oversupply on international markets has resulted in nearly a 50% decline in nominal coffee prices (ICO, 2011). According to a rough calculation made by the United Nations Conference on Trade and Development (UNCTAD) secretariat, between 1999 and 2002, producing countries earned US$19 billion less in revenues than if prices had remained at their 1998 levels. For the small farmers that account for approximately 70 per cent of coffee
production, declining prices have a direct impact on overall household revenues and access to basic needs. Declining prices are also associated with declining job quality and security for employees serving plantations, many of whom represent the poorest section of the population serving the coffee supply chain. According to Bolwig et al., (2009), although low prices on the world market are one of the most important determinants of economic sustainability in the coffee sector at present, they form part of a larger web of economic constraints generally facing coffee producers. The damaging effects of long-term declining terms of trade facing coffee producers are exacerbated by significant price volatility. Price volatility together with rigidities of production and the consequent distribution costs, make it extremely difficult for coffee producers and policy-makers alike to determine optimal production strategies. Coffee, like other agricultural goods, is a seasonal product requiring investments prior to harvest and revenue returns. Small farmers with a low capital and savings base frequently rely on advances and credit to supply requisite pre-harvest inputs and living expenses in many coffee-producing communities, local coffee buyers fill the credit gap through advance purchases at highly-discounted rates. Although local buyers fulfill an important role through such credit provisions, poor infrastructure development and anti-competitive practices regularly result in a net transfer of value down the supply chain, placing still greater financial pressures on producers (Robert, 2012). Meanwhile, tariffs on processed forms of coffee in importing countries can also have an effect on the revenue captured by producer countries from the supply chain. The elimination of economic clauses from International Coffee Agreements since 1989 has reduced the effectiveness of international cooperation for stabilizing prices.

Halysio (2012), recognize the worth of coffee if well evaluated, it has the potential to increase household productivity hence rural development. The sector employs over five million people both at the farms, and post harvesting processes, and remains a key source of income for the rural poor households in many Districts all over the country. Manrique et al., (2014), noted that coffee production has the potential to improve the socioeconomic and welfare development at household level for the families involved the coffee farming and business. Coffee thus not only represents a large number people, the way it is grown and marketed means that it defines social activities that are the very essence of life in significant parts of Uganda. Despite the fact that, coffee plays an important role in the economic development of this country, there has been an increasing decline in coffee production (UCDA, 2012).
1.2 Problem Statement
The coffee crisis is threatening the social welfare of communities that rely heavily on coffee cultivation for their livelihoods. This is bad news for producers, mostly for local households who heavily rely on the cash crop as their main source of income.

Uganda’s coffee production is forecasted to decrease in the marketing year (MY) 2016/2017 to 3.7 million bags from a record 4.5 million bags production in the MY 2015/2016 which is 1.78% decrease due to the effects of biennial bearing cycle (UCDA, 2016). However, with the recent changes in climatic seasons which have intensified droughts in the country, the decrease might be more if left unchecked. This will adversely reduce Uganda’s agricultural export earnings where coffee exports contribute on average of 60% of Agricultural annual export revenues.

Again since it is projected that 20% of the total population earn all or a large part of their cash income from coffee and its value chain activities (ICO, 2011), a decline in coffee production means a fall of millions of Ugandans into poverty. The purpose of this study is therefore to examine different factors responsible for increase/decline in coffee production which can be used to boost coffee production. Understanding of how these factors influence on coffee production will go a long way in developing specific strategies to improve coffee production among farmers in Bukomansimbi District.

1.3 General objectives
To investigate the factors affecting small scale coffee production in Kibinge sub county.

1.3.1 Specific objectives
1. To establish the relationship between sex of the farmers and level of coffee production
2. To establish the relationship between level of education of the farmers and level of coffee production
3. To establish the relationship between farmers’ household size and level of coffee production
4. To establish the relationship between farmers’ income and level of coffee production
5. To establish the relationship between access to credit by the farmers and level of coffee production.
6. To establish the relationship between the farmers’ farm size and level of coffee production.

1.4 Research Hypothesis

The following research null hypothesis will be examined to reach the research objectives;

1. Sex of the household head does not influence coffee production
2. Income level of the household head does not affect coffee production
3. Education level of the household head does not affect coffee production
4. Household size doesn’t influence coffee production
5. Farm size of the household doesn’t influence production
6. Access to credit have no influence on coffee production
7. Access to Extension services have influence on coffee production

1.5 Justification of the study

The study intends to be of importance in exposing the factors affecting small-scale coffee production in Kibinge Sub County helping the country to realize how these challenges can be minimized to improve the coffee sub sector. This would be of significance in providing greater insight into the production, financing resources, factors and marketing that contribute towards declining coffee production. The research will also fill the gaps in the studies previously carried out by other researchers regarding the declining coffee production in Uganda and also enable other researchers to carry out the study beyond this scope. To the researcher, it will give a better understanding of the issues under investigation and also sharpen research skills.

1.6 Scope of the study

The study will be conducted using data compiled from the local farmers in Bukomansimbi district. In terms of coverage the study will cover a period of 2016 to 2017 harvesting season as it is the most recent period which will increase the usability and relevance of the study findings.
1.7 Conceptual framework

In the conceptual framework of study, the independent variables are socio-economic characteristics and socio-demographic factors while the dependent variable is coffee production. The socio-demographic characteristics of farmers include gender, age, level of education, labor availability, marital status, and size of the family. Also, socio-economic factors play a major role in influencing coffee production in Bukomansimbi district. These include extension services, farm size, access to markets, farmer organizations, other source of income and access to credit.

Figure 1: Conceptual framework adopted for the study

- **Socio-demographic factors**
  - Sex
  - Age
  - Level of education
  - Marital status
  - Size of the household
  - Labor available

- **Socio-economic factors**
  - Access to market
  - Access to credit
  - Other source of income
  - Access to extension services
  - Farmers’ organizations
  - Farm size

Coffee production
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction
This chapter generally reviews literature on productivity of coffee, factors influencing coffee production; socio-demographic and socio-economic, and challenges facing coffee production

2.2 Factors Influencing Coffee Production

2.2.1 Socio-demographic factors
Many studies that have been conducted show that a relative contribution of each socio-demographic factor depends on the type of the enterprises and their associated innovations (Al-Shadiadeh, 2012; Altarawneh, 2012). The socio-demographic factors of farmers include gender, age, and income, level of education, farm size, marital status, and household size.

Age of the farmer
Age of the farmer is usually considered with the assumption that older farmers will have more knowledge, skills and enough experience in farming which enables them to easily be more productive than others. However, with regard to age, different studies report different results. For example, a study conducted by Gockowski and Ndoumbe (2004) on the intensive mono-crop, horticulture farming in southern Cameroon indicated that younger farmers were more likely to be more productive.

Gender of the farmer
Wokia-azi (2008) in his study on cocoa production ascertained that gender disparity with regards to land occupation is one of the problems affecting the multiplicity and increasing harvest in the cocoa growing communities. According to them, women are highly disfavored and certain cultures sometimes do not allow them to own land and as such, access to land is limited compared to the men. Through different mechanisms, women are strongly disadvantaged when it comes to extension services, marketing and control of proceeds.
Farmer’s Household size

Household size is among the important socio-economic characteristics which influence crop productivity because a fairly large family size implies more family labor available for the household farm activities (Ozor and Cynthia, 2010). Household size is an obvious possible advantage in terms of farm labor supply when it is relatively large.

Education level of the farmer

Education level is a socio demographic characteristic of great importance as it determines one’s ability to comprehend and analyze issues before taking any action. Thus, education level is very useful in technology adoption for improved crop productivity. As Ozor and Cynthia (2010) assert, an increase in educational status of farmers positively influence the adoption of improved technologies and practices. Furthermore, as Opara (2010) argues, farmers with basic education are better equipped for making more informed decision for lives and for their communities as well as becoming active participants in economic, social, and cultural dimensions of development. Likewise, the study by Adenuga et al. (2013) found that education, unlike other socio-demographic factors like age, labour, gender and farm size, significantly influenced production and productivity of coffee. Evidence on the efficiency of small-scale coffee farmers’ production from a study by Abu et al. (2011) shows that socio economic variables of farm size, and labour size significantly influenced coffee output. Moreover, education, and farmers’ experience have significant impact on coffee output.

2.2.2 Socio-economic factor that influence coffee production

Sources of income

Main source of income is also among the socio-economic characteristics that is said to influence farming decisions by the farmer because farm practices depend on capital investment especially when the capital is dependent on the existing sources of income (Mathenge and Tschirley, 2008). Under such circumstances, it is plausible that earnings from off the farm may often be used to compensate for the missing and imperfect credit markets by providing ready cash for input purchases as well as other household needs. In addition, off and on farm earnings could be used to spread the risk of using these modern farm inputs to the extent that farmers choose traditional
over modern inputs in order to lower their risk. Thus, any mechanism that allows farmers to smoothen consumption will raise the use of modern inputs and increase farm productivity.

**Access to credit**

Access to credit is regarded as one of the key elements in raising agricultural productivity (Anyiro and Oriaku, 2011). Micro credit is the name given to extremely small loans made to poor borrowers whose role is to enhance the production capacity of the poor resource farmers through financial investment in their human and physical capital. Thus, households with access to credit may be of help to farmers in obtaining the capital required for adopting the higher profit production technologies and therefore increase productivity (Wachira, 2012). According to Oladeebo (2008), availability of adequate and timely credit helps farmers in expanding the scope of operation and adoption of new technology as well as enhancing the purchase and use of some improved inputs which are not available on the farm. Nyemeck et al. (2007) concluded that there is the need to promote credit institutions which specializes in savings, mobilization and credit supply to smallholders.

**Access to extension services**

Extension services reflected by the number of extension contacts either through farm visits made or training sessions received prior to and during production season influence crop productivity (Anyiro and Oriaku, 2011). This is because farmers who get in touch with the extension agent are likely to get the right information not only on a technology but also its profitability.

**Market factors**

Access to market and availability of market are bound to reduce marketing costs on matters such as transport and other transaction costs and offer favourable price for coffee (Wachira, 2012; Anyiro and Oriaku, 2011). Access to market may be analyzed in terms of the distance in kilometers to the market reflecting the marketing costs that one incurs in the course of accessing the market and thus thought to have a negative effect on productivity as it reduces the profits which might be obtained from marketing farm outputs (Wachira, 2012). Farmers’ organizations help them to participate in group activities, as they may tend to share ideas on profitable enterprises and adopt them as well as engage in market activities of input acquisition or selling of
produce and thereby improve their profits. Consequently, organized farmer groups are promoted as useful avenues for increasing farmer productivity and for the implementation of food security and other development projects (Lenis, 2012).

2.3 Challenges facing coffee production

Uganda’s coffee industry has experienced various challenges, among which low production is one of the most crucial problems encountered directly by smallholder farmers. These constraints have generated low yields that pose large challenges to small-scale farmers’ livelihoods. Pests and diseases are frequently perceived by researchers as well as farmers to be the primary reason responsible for coffee yield reduction. Coffee wilt disease (CWD) is perceived by UCDA (2012) as being one of the most important constraints that threatens Robusta production in Uganda. The presence of coffee wilt disease can be identified on young as well as aged Robusta trees with symptoms of wilting of branches and stems (UCDA, 2012). In the past decades, coffee wilt disease has affected nearly half of the total Robusta population in Uganda and caused a considerable yield reduction.

Other limitations are the poor and unproductive soils and unfavorable climate conditions. Due to the lack of financial support, the majority of coffee producers in Uganda apply little to no technical inputs to address fertilization, weeding, mulching and pest and disease management (Shively and Hao, 2012). Consequently, coffee production is highly relying on existing soil fertility and on natural climate conditions. In addition to soil constraints, the potential effects of increasing change of global climate on coffee production have been recognized recently (Robert, 2012). With only a few regions applying irrigation, Uganda’s agriculture is highly susceptible to climate change (Shively and Hao, 2012). Climate change might significantly affect coffee production and therefore the Ugandan smallholder farmers who have already encountered various agro-ecological and socioeconomic constraints and barely have coping strategies available are more likely to be affected.
CHAPTER THREE

METHODOLOGY

3.0 Introduction
This chapter outlines the research design of the study, study area, the target population included in the study, strategies which the researcher will use to select the representative sample of the population, data collection tools, and how the data will be analyzed, interpreted and presented.

3.1 Research design
The researcher embraced descriptive survey designed to assess the nature and development of Coffee sector and its problems with a view to offer solutions. It employs the use of interviews and administration of questionnaires to a sample of individuals to find out peoples’ attitudes, opinion about performance and problems facing coffee sector in Uganda. The research used both primary and secondary data. Primary data was obtained using questionnaires while secondary data was gathered from the documentaries, and journals.

3.2 Study area
Bukomansimbi District is bordered by Gomba District to the north, Kalungu District to the east, Masaka District to the southeast, Lwengo District to the southwest and Sembabule District to the northwest. Bukomansimbi, where the district headquarters are located, lies approximately 26 kilometres (16 mi), by road, northwest of Masaka, the nearest large city. This location is approximately 150 kilometers (93 mi), by road, southwest of Kampala, the capital of Uganda and the largest city in that country. The coordinates of Bukomansimbi District are: 00 10S, 31 39E

3.2.1 Economic activities in the study area
Agriculture is the major economic activity in Bukomansimbi district. 91.4% of the population is engaged in crop growing, 67.2% engaged in livestock farming and 93.3% is engaged in any agricultural activity. Majority of farmers are small holders who grow both perennial and annual crops. The perennial crops include Banana, Coffee, and Tea, while the annuals include maize,
sweet potatoes, beans, cassava and groundnuts. The annual crops are mostly grown for home consumption.

The surplus production however is sold in the local and urban markets. Coffee production has taken its original position as the major income earner amongst most of the farmers. The demand for coffee plantlets has therefore risen.

3.3 Target Population
The target population for the study are all the small scale coffee producers in Bukomansimbi district. Due to their large number, Kibinge sub-County was selected as the accessible population since all the coffee producers there produce in small scale.

3.4 Sample Size and Sampling Technique
Stratified sampling technique was used to help the researcher to achieve desired representation from the various parishes which were then used as strata. A sample size determination table was used to determine the desired sample size. For the 21551 population, at 90 percent confidence level and 10% marginal error, the sample size is 150. This is the largest sample size for the population at 90 percent confident level. The sample size for the study is calculated using the simple random design formula.

\[
N = \text{deff} \times \frac{z^2 PQ}{e^2} \times \frac{100}{rr} \quad \text{.................................} \quad \text{(Equation 3.1)}
\]

Where N is the sample size of population

Z is the statistics for normal distribution that is \((z=1.645)\)

P proportion of eligible coffee farmer in the total population 0.5

Q Proportion of non-eligible citizen that is below 18yrs to the total population is \(q=0.5\)

E is the accepted error e=0.1, deff is the design effect (deff =2 for stratified sampling), rr is the response rate (assumed at 90%)

\[
N=2 \times \frac{1.645^2 \times 0.5^2}{0.1^2} \times \frac{100}{90}
\]
= 150 respondents.

3.5 Selection of respondents
Respondents were selected by stratified sampling from the parishes of Kibinge sub-county.

The following formula was applied to determine the sample size of each parish depending on the total population from each village.

\[ n_1 = \frac{N_1}{N} \times n \]  

(Equation 3.2)

Where \( n_1 \) is the sample size of target population for each parish

\( n \) is the total sample to be selected in the sub-county

\( N_1 \) is the total population in the parish

\( N \) is the total population in the sub-county

Total population of Kibinge Sub County and the sample size per parish

<table>
<thead>
<tr>
<th>Parish</th>
<th>Parish population</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butayunja</td>
<td>4224</td>
<td>29</td>
</tr>
<tr>
<td>Kiryasaaka</td>
<td>7585</td>
<td>53</td>
</tr>
<tr>
<td>Maleku</td>
<td>8341</td>
<td>58</td>
</tr>
<tr>
<td>Mirambi</td>
<td>1401</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>21551</td>
<td>150</td>
</tr>
</tbody>
</table>

3.6 Instruments of data collection
The data was collected using questionnaires, interview schedules and document analysis on secondary data. The questionnaires were prepared and administered on respondents by the researcher through face-to-face method. The document analysis focused on observation of documentations relevant to the study such as text books, journals, reports and publications. The questionnaires were both open and closed ended questionnaires to allow variety and in-depth information.
3.7 Data processing and analysis

Once the questionnaires were collected, they would be examined to ensure that they were fully filled and consistent. They would then be numbered and checked to see that all the items were answered according to instructions in order to reduce errors and maintain the validity of the data. Quantitative data was analyzed by tallying the responses of the closed ended questions. The data was coded and entered into the computer for analysis using Microsoft excel, SPSS AND STATA.

3.7.1 Univariate analysis

This was used at the first level of analysis where independent variables were analyzed and presented inform of frequencies and percentages describing selected socio-demographic and socio-economic characteristics of the respondents as well as coffee production.

3.7.2 Bivariate analysis

At this level of analysis, the researcher tested the relationship between the independent variables and the dependent variables by use of correlation statistics to establish the level of association between the two variables.

It was presented in the form of tables. The collected data was carefully analyzed quantitatively and qualitatively and presented in form of frequency, percentages and tables for ease of presentation and discussion.

The general formula correlation coefficient is as follow

\[ r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}} \]  

Where:

N = number of pairs of scores

\( \sum XY \) = sum of the products of paired scores

\( \sum X \) = sum of X scores

\[ r \] = correlation coefficient

……………..  (Equation 3.3)
\[ \sum Y = \text{sum of } Y \text{ scores} \]

\[ \sum X^2 = \text{sum of squared } X \text{ scores} \]

\[ \sum Y^2 = \text{sum of squared } Y \text{ scores} \]

**Analysis of Variance**

The following formula will be used to test the relationship between categorical independent variables and un-categorical dependent variable

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of squares</th>
<th>Degrees of freedom</th>
<th>Mean square</th>
<th>F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between the means</td>
<td>SSA= ( r \sum (\bar{x}_j - \bar{x})^2 )</td>
<td>( c-1 )</td>
<td>MSA=( \frac{SSA}{c-1} )</td>
<td>( \frac{MSA}{MSE} )</td>
</tr>
<tr>
<td>Within the samples</td>
<td>SSE= ( \sum \sum (\bar{x}_{ij} - \bar{x})^2 )</td>
<td>( (r-1)c )</td>
<td>MSE=( \frac{SSE}{(r-1)c} )</td>
<td>( \ldots \ldots )</td>
</tr>
<tr>
<td>Total</td>
<td>SST=SSA+SSE</td>
<td>( rc-1 )</td>
<td>( \ldots \ldots )</td>
<td>( \ldots \ldots )</td>
</tr>
</tbody>
</table>

\[ \bar{x} = \frac{\sum\sum x_{ij}}{rc} \] where; \( r= \) observations, \( c= \) samples, \( \bar{x} = \) grand mean

\[ \bar{x}_j = \frac{\sum x_{ij}}{r} \bar{x}_j = \text{mean of sample } j \]
3.7.3 Multivariate Analysis
At this level of analysis, multivariate regression model was used to establish the socio-demographic and socio-economic factors that influence coffee production. The regression model formula is given below

\[ Y_{ij} = \beta_0 + \beta_{ij} X_{ij} + e_i \]  \hspace{1cm} (Equation 3.4)

**Where;**

\( Y_{ij} \) = total farm output of coffee (bags)

\( \beta_0 \) = intercept

\( \beta_{ij} \) = set of regression coefficients

\( X_{ij} \) = set of socio-economic and institutional factors, \( e_i \) = residual standard deviation
CHAPTER FOUR

RESEARCH FINDINGS, INTERPRETATION AND DISCUSSION

4.0 Introduction
This chapter presents the findings of the study on the factors affecting the small scale coffee production in Bukomansimbi District, a case study of Kibinge Sub County. It discusses the descriptive characteristics of the respondents and the various relationships between the different factors.

4.1 Descriptive Analysis of the Respondents
A descriptive analysis was done about the respondents’ demographic factors and the results obtained are as presented below

4.1.1 Sex of the respondents
The figure1 below shows the sex distribution of the respondents.

Figure 2: Sex of the respondents

The majority of the respondents were males (62.67%). This shows that males participate more in the coffee production in Kibinge Sub County.
4.1.3 Education Level
The figure below shows the education level of the respondents.

Figure 3: Education level of respondents

![Pie chart showing education levels]

**Figure 4: Education level of respondents**

The bigger proportion of the respondents (40.67%) has a primary level of education, followed by those with Secondary School level (38.67%). From the statistics, it's indicating that the education of Bukomansimbi is lacking and needing. This is illustrated with the bigger proportion of the producers being at primary school level.

4.1.4 Marital Status
The figure below represents the marital status of the respondents.
Figure 5: Marital Status of the respondents

The majority of the respondents (70.95%) were married followed by the single (9.459%) and divorced (9.459%).

4.1.4 Income level
The table below represents the income of the respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>150</td>
<td>35,000</td>
<td>1,500,000</td>
</tr>
</tbody>
</table>

The minimum and maximum incomes of the respondents are 35,000 and 1,500,000 respectively. These are the monthly incomes of the coffee producers in the Sub County.

4.1.5 Family Size
The table below represents the family size of the respondents
Table 2: Family size

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Size</td>
<td>150</td>
<td>6.153333</td>
</tr>
</tbody>
</table>

The average family size of the respondents is 6 (six) members.

4.1.6 Occupation

The figure below represents the occupation of the respondents.

Figure 6: Occupation of the respondents

The bigger percentage of the respondents falls in farming (37.33%) and Private Business (37.33%). This is followed by civil employment (22.67%).
4.2 Bivariate Analysis

A bivariate analysis was carried out to establish whether the independent variables are significantly related with the dependent. For the analysis, spearman’s rank correlation was used when both variables are numeric, chi-square analysis for when they are both categorical and Analysis of Variance for when one variable is categorical and the other uncategorical.

4.2.1 Relationship between Sex and Level of Coffee Production

Table 3: Relationship between Sex and Level of Coffee Production

<table>
<thead>
<tr>
<th>Analysis of Variance</th>
<th>Source</th>
<th>Sum of Squares</th>
<th>Degree of freedom</th>
<th>Mean Square</th>
<th>F ratio</th>
<th>Prob&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td>511.3078</td>
<td>1</td>
<td>511.3078</td>
<td>2.92</td>
<td>0.0893</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>25872.97</td>
<td>148</td>
<td>174.8173</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>26384.27</td>
<td>149</td>
<td>177.0757</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since the tabulated F-value at 5% level of significance is greater than the critical (2.92>0.0893), we accept the null hypothesis. Therefore, sex and level of coffee production are not significantly related and the sex variable is not taken on for further analysis.

4.2.2 Relationship between Education Level and Level of Coffee Production

Table 4: Relationship between Education Level and Level of Coffee Production

<table>
<thead>
<tr>
<th>Analysis of Variance</th>
<th>Source</th>
<th>Sum of Squares</th>
<th>Degrees of freedom</th>
<th>Mean Square</th>
<th>F-ratio</th>
<th>Prob&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td>357.2396</td>
<td>3</td>
<td>119.0799</td>
<td>0.67</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>26027.03</td>
<td>146</td>
<td>178.2674</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>26384.27</td>
<td>149</td>
<td>177.0757</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bartlett’s test for equal Variances: $\chi^2(3)=52.7962$  Prob> Chi2=0.000
Since the tabulated F-value at 5% level of significance is greater than the critical (0.67>0.5730), we accept the null hypothesis that there is no variation in the mean level of coffee production for respondents with different levels of education. Therefore, education level is not taken on for further analysis.

4.2.3 Relationship between Household Size and Level of Coffee Production

Table 5: Relationship between Household Size and Level of Coffee Production

<table>
<thead>
<tr>
<th>Number of observations</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's ρ</td>
<td>0.3828</td>
</tr>
<tr>
<td>Test of Ho: Family size and Yield are independent</td>
<td></td>
</tr>
<tr>
<td>Prob&gt;</td>
<td>t</td>
</tr>
</tbody>
</table>

There is a weak positive relationship between household size and the level of coffee production(r=0.3828). Since the tabulated P-value at 5% level of significance is less than the critical (0.000<0.05), we reject the null hypothesis that family size and yield are independent. This variable is therefore taken on for further analysis.

4.2.4 Relationship between Income Level and Level of Coffee Production

Table 6: Relationship between Income Level and Level of Coffee Production

<table>
<thead>
<tr>
<th>Number of observations</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's ρ</td>
<td>0.3246</td>
</tr>
<tr>
<td>Test of Ho: Income and Yield are independent</td>
<td></td>
</tr>
<tr>
<td>Prob&gt;</td>
<td>t</td>
</tr>
</tbody>
</table>

There is a weak positive relationship between the income level of a respondent and the level of coffee production(r=0.32446). Since at 5% level of significance, the tabulated P-value is less
than critical (0.0001<0.05), we reject the null hypothesis. Income level is therefore taken on for further analysis.

4.2.5 Relationship between Access to Credit and Level of Coffee Production

Table 7: Relationship between Access to Credit and Level of Coffee Production

<table>
<thead>
<tr>
<th>Analysis of Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
</tr>
<tr>
<td>Between Groups</td>
</tr>
<tr>
<td>Within Groups</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Bartlett’s test for equal Variance: Chi2(1)=7.5279  Prob>Chi2=0.006

Since at 5% level of significance the tabulated F-value is less than critical (0.00<0.9975), we reject the null hypothesis that the mean level of coffee production between respondents that have access to credit and those that do not is equal. Access to credit is therefore taken on for further analysis.

4.2.6 Relationship between Farm Size and Level of Coffee Production

Table 8: Relationship between Farm Size and Level of Coffee Production

<table>
<thead>
<tr>
<th>Number of observations</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's ρ</td>
<td>0.7788</td>
</tr>
<tr>
<td>Test of Ho: Plot size and Yield are independent</td>
<td>Prob&gt;</td>
</tr>
</tbody>
</table>

There is a strong positive relationship between the plot size and the level of coffee production (r=0.7788). Since at 5% level of significance the tabulated P-value is less than the critical (0.0000<0.05), we take on the variable for further analysis.
4.3 Multivariate Analysis

In this section, we test the null hypothesis against the alternative hypothesis using the p-value statistics for individual relationships. The analysis was done using STATA and the findings shown in the table below.

| Yield          | Co-efficient | Standard Error | t    | P>|t| | 95% Confidence interval |
|---------------|--------------|----------------|------|------|-------------------------|
| Family Size   | 1.476682     | 0.3487829      | 4.23 | 0.000| 0.787326 - 2.166037     |
| Income        | 9.43E-06     | 4.03E-06       | 2.34 | 0.021| 1.46E-06 - 1.74E-05     |
| credit facilities | 2.71609       | 1.732343       | 1.57 | 0.119| -0.70782 - 6.139995     |
| Plot size     | 2.112443     | 0.3326484      | 6.35 | 0.000| 1.454977 - 2.769909     |
| _constant     | -7.703226    | 3.95423        | -2   | 0.053| -15.5186 - 0.1121502    |

From the bivariate analysis, only family size, income, access to credit facilities and plot size were taken on for further analysis.

At the multivariate level of analysis, only family size, income, and plot size of the farmer were found to be significant. Therefore, the model will contain only these variables.

From the regression analysis, the following was obtained

Family size (1.47). This implies that an increase in family size by one unit leads to a 1.47 increase in the level of coffee production.

Income (9.43). This implies that an increase in the respondent’s income by one unit leads to a 9.43 unit increase in the level of coffee production.

Plot size (2.11). This implies that a unit increase in the plot size leads to a 2.11 unit increase in the level of coffee production.

The Model:

From the above findings, our model is;

\[ Y_i = -7.703 + 1.47P + 9.43Q + 2.11S \] (Equation 4.1)
Where;

Yi-level of coffee production
P- Family size
Q- Income
S-Plot size
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the findings, conclusions and recommendations of the study. It presents the conclusions based on findings from the preceding chapter and recommendations with regards to the findings.

From the multivariate analysis we concluded that of the variables under consideration, only family size, income, and plot size are significantly related to the level of coffee production and were therefore included in the model.

5.1 Summary of Findings

The summary of the findings is based on the objectives of our study.

5.1.1 The Relationship between Plot Size and the Level of Coffee Production.

From the analysis, we concluded that there is a strong positive relationship between the plot size and the level of output. This implies that an increase in the plot size leads to an increase in the level of production. This can be explained by the ability of farmers to practice mechanization on larger plots hence increased productivity. This finding is backed by a study on the relationship between farm size and productivity (Thapa, 2007).

5.1.2 The Relationship between Income and the Level of Coffee Production

From the study findings we concluded that there is a weak positive relationship between the income level of a respondent and the level of coffee production. This implies that an increase in the income level leads to an increase in the level of coffee production. This can be explained by increased ability to acquire various factors like fertilizers, labor and machinery that enhance productivity (Mathenge and Tscharley, 2008).
5.1.3 Relationship between Household Size and the Level of Coffee Production

Study findings showed that there is a weak positive relationship between household size and the level of coffee production. This implies that an increase in the family size leads to an increase in the coffee yield. This can be explained by an increase in the amount of labor available for farm work which increases productivity (Ozor and Cynthia, 2010).

5.2 Conclusion

As discussed in previous chapters, the factors affecting small scale coffee production in Bukomansimbi district were discussed in relation to sex of the farmer, level of education, household size, income, credit accessibility and farm size. These variables were analyzed at univariate, bivariate and multivariate levels and conclusions drawn.

The results from the study showed that the plot size, level of income, and household size have a significant positive relationship with the level of coffee produced. Implying that an increase in the plot size, level of income and household size lead to an increase in the level of coffee produced. This was found to be consistent with other literature as cited above.

5.3 Recommendations

Given the above discussions, we notice that the farmer’s plot size, level of income, and household size have a positive relationship with the level of coffee produced.

I would therefore front for the setting up of projects that can enhance the farmers’ skills besides farm work. This non-farm income can complement on the farm income thereby increasing on their ability to purchase the various inputs and mechanization is made easier.

The government should also help to put up reliable and sustainable land reforms. These reforms should however, aim at making it easy to acquire land so as to boost productivity. This would greatly improve the level of coffee production.
5.4 Areas of Further Study

Since there are very few studies on farm size and productivity relationship in Uganda, results from this study can be used for further empirical studies. Further studies need to explore the impact of land fragmentation and the distance of farmland from the homestead on farm productivity.
REFERENCES


Bachke, M. E. *Are farmers’ Organisations a good Tool to improve farmers’ welfare?* University of Life Sciences, Norway, Department of Economics and Resource Management.


QUESTIONNAIRE

*The main objective of this study is to assess the factors affecting small scale coffee production in Bukomansimbi district.* The study is a partial fulfillment for the award of degree in quantitative Economics of Makerere University. You have been randomly selected and your participation is completely voluntary and you have the right **NOT** to participate in this survey at all or **STOP** participation at any point in time during the survey. All finding of the study will be held in confidentiality. If you orally agree to participate in this study, then you may sign or thumb print below

.............................. Signature

**SECTION A: Socio-demographic characteristics of farmers**

<table>
<thead>
<tr>
<th>Qn1</th>
<th>Sex of respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1) Male  2) Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qn2</th>
<th>What is your age in years?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>............................................</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qn3</th>
<th>What is your education level?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1=Not attended any formal education  2=Primary school 3=Secondary school 4=Tertiary education</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qn4</th>
<th>What is your marital status?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1=Single  2=Married  3=Divorced 4=Widowed  5=Separated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qn5</th>
<th>Apart from being a coffee grower, what is your other occupation(s)?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1=Farming (other than coffee growing) 2=civil employment</td>
</tr>
<tr>
<td>Question</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Qn6</td>
<td>What is your total monthly income in shillings?</td>
</tr>
<tr>
<td>Shs.</td>
<td>Shs. ……………………</td>
</tr>
<tr>
<td>Qn7</td>
<td>What is your family size?</td>
</tr>
<tr>
<td></td>
<td>………………</td>
</tr>
<tr>
<td>Qn8</td>
<td>What is the source of labour in coffee production</td>
</tr>
<tr>
<td>1=Hired</td>
<td>2=Family</td>
</tr>
</tbody>
</table>

**SECTION B: Socio-economic factors**

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qn11</td>
<td>Where do you sell your coffee</td>
</tr>
<tr>
<td>1=To coffee middle men</td>
<td>2=Joint Cooperatives</td>
</tr>
<tr>
<td>Qn12</td>
<td>What is the average distance in km from your field to the main market?</td>
</tr>
<tr>
<td></td>
<td>………………</td>
</tr>
<tr>
<td>Qn13</td>
<td>Do you have access to credit facilities for your farming activities?</td>
</tr>
<tr>
<td>1=Yes</td>
<td>2=No</td>
</tr>
<tr>
<td>Qn14</td>
<td>Do you have access to extension services?</td>
</tr>
<tr>
<td>1=Yes</td>
<td>2=No</td>
</tr>
<tr>
<td>Qn15</td>
<td>Is there any association that joins you as farmers?</td>
</tr>
<tr>
<td>1) Yes</td>
<td>2) No</td>
</tr>
<tr>
<td>Qn16</td>
<td>If yes, are you a member?</td>
</tr>
<tr>
<td>1) Yes</td>
<td>2) No</td>
</tr>
</tbody>
</table>
### C. COFFEE PRODUCTION

<table>
<thead>
<tr>
<th>Q17</th>
<th>How long have you been growing coffee?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>..........................................</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q18</th>
<th>What is the size in (acres) of your coffee plot?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>....................................................</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q19</th>
<th>How did you get the plot you use for coffee production?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1=Own land  2=Part is owned and part is hired  3=All hired</td>
</tr>
<tr>
<td></td>
<td>..................................................................</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q20</th>
<th>What was your coffee yield during the last season? (in bags=100kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>..................................................................</td>
</tr>
</tbody>
</table>

**THANK YOU FOR YOUR COOPERATION**