

**SOCIAL ECONOMIC FACTORS INFLUENCING TEA PRODUCTION BY SMALL  
HOLDER TEA FARMERS: A CASE OF KIRINYAGA COUNTY IN KENYA**

**BY**

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## DECLARATION

This research project report is my original work and has not been presented for a degree or other award in any other university.

Signature ..... 

Date..... 13-08-2012

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L50/60687/2011

This research project report has been submitted for examination with my approval as the university supervisor.

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## **DEDICATION**

This work is dedicated my wife Salome, son Raphael, our daughters Mercy and Mary for their understanding, patience, encouragement and support while pursuing this course.

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## ABBREVIATIONS AND ACRONYMS

<b>FAO</b>	Food and Agricultural Organization.
<b>G.O.K</b>	Government of Kenya.
<b>KIPPRA</b>	Kenya Institute of public Research and Analysis.
<b>KTDA</b>	Kenya Tea Development Agency Limited.
<b>TBK</b>	Tea Board of Kenya.
<b>TRFK</b>	Tea Research Foundation of Kenya.

## ABSTRACT

According to literature the World tea supply was increasing at a higher rate than demand. The world was concerned about an oversupply of tea against decreasing consumption and low prices. This study intended to inquire into social economic factors influencing increased tea production. This case study focused on smallholder tea farmers in Kirinyaga County and was guided by the four main objectives. The study aimed at assessing how levels of education and poverty influenced tea production. The study also wanted to establish how availability of farm inputs and tea market influenced tea production by the smallholder tea farmer. Kenya continues expanding tea production and is observed to be largest World black tea exporter after Sir Lanka.

Descriptive survey design was used as the research methodology for this study. A valid and reliable structured questionnaire was used as the principal research instrument. The main findings of the study were that education levels, availability of both farm inputs and market, and poverty, all interact to influence increased tea production.

The analysed findings mainly indicated that, a more understanding of the social economic variables surrounding tea production by the policy makers and tea related institutions was necessary in order to plan adequately for the smallholder tea farmer. This study recommended that the Government, the Tea Board of Kenya, the Tea Research Foundation of Kenya and the KTDA put down an appropriate infrastructure and formulate sustainable tea technologies. Economical strategies for the farmer will also be required. Further research was recommended in various areas.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

Kenya exports 95% of its total tea production and is only able to consume 5%. (Tea Board of Kenya, 2011) The global community is concerned about the persistent world tea oversupply against depressed prices and declining consumption. While the global tea production increased at an average of about 7.54% between 2009 and 2010, tea production from Kenya expanded by 26.99%. Kenya's global tea output had been projected to reach 379 000 tonnes by 2014, and by the year 2010 Kenya had already produced 399 000 tonnes, surpassing the projections. (Food And Agricultural meeting, Intergovernmental group on tea, 2005).

Malawi experienced a tea production decline of 1.9% during the same period. Other countries which recorded declining tea production were Indonesia and North India as evidenced in the table below.



**Table 1.1 World tea production from main producing countries (2010)**

<b>Country</b>	<b>2009 (tonnes)</b>	<b>2010 (tonnes)</b>	<b>change</b>
Indonesia	77 600	72 200	-6.96%
North India	734 800	722 800	-1.63%
South India	230 600	243 400	5.55%
Sri Lanka	278 800	328.0	17.65%
Kenya	314 200	399 000	26.99%
Uganda	48 500	52 800	8.86%
Tanzania	31 600	31 600	0.00%
Malawi	52 700	51 700	-1.90%
Zimbabwe	12 100	13 800	1.40%
<b>Total</b>	<b>1780 900</b>	<b>1 915 300</b>	<b>7.54%</b>

**Source: Tea Brokers East Africa Limited report (2011)**

The world tea producers raised an alarm on Kenya's increasing tea production against

depressed world prices. Kenya was noted to have the largest tea production increase during an intergovernmental meeting held in Bali, Indonesia in 2005, where it was noted that as the world tea exports increased by 4.4 percent in 2004 to reach 1.47 million tonnes; Kenya was the largest exporter, surpassing Sri Lanka. The country's cumulative local tea consumption for the year 2011 stood at 20,000 tonnes against a production of 377 900 tonnes (Tea Board of Kenya statistics, 2010). During the year 2011, Kenya's tea market share outlet was 95.45% for export and 3.86% for domestic consumption. The above statistics indicate that tea produced in Kenya relies heavily on foreign market.

In the year 2000, Kenya's annual tea yield totalled 160,296 tonnes while in 2010 the production had risen to 399 000 tonnes, showing a 148.9% increase. In 2000, Kirinyaga County produced 8,271 tonnes while in 2010 production had risen to 17 988 tonnes which was an increase of 117.5%. Table 1.2 below shows Kirinyaga County experienced a steady increase in tea production over a period of five years as compared to its neighbouring Counties. From the year 2005 to 2010 Kirinyaga County had a total increase in tea production of 21.69% while Nyeri County on the Western border and Embu County on the Eastern border registered 8.30% and 8.73% increase in tea production respectively. Kakamega County realised a decline in tea production of 12.67% over the same period. Tea is normally grown under similar agro-climatic conditions in Kenya (Tea Growers Hand book, 1985).

**Table 1.2 Tea yields in some Counties of Kenya**

<b>County/Year</b>	<b>2005 ( million kilograms)</b>	<b>2010(million kilograms)</b>	<b>Percentage Change (%)</b>
Kericho	76,774,099	90,330,783	17.66
Nandi	39,835,387	57,916,765	45.39
Kisii	16,298,852	16,764,497	2.85
Nyeri	18,554,550	20,094,047	8.30
Kirinyaga	14,782,166	17,988,271	21.69
Embu	10,204,127	11,095,445	8.73
Kakamega	3,383,203	2,954,412	-12.67

**Source: Tea Board of Kenya statistics (2010).**

The trend of tea production in Kirinyaga and Nandi Counties is portrayed by Kenya at international level over the past six years. However this study will find out the social economic factors influencing tea production by smallholder tea farmers in Kirinyaga County due to inaccessibility of Nandi county.

## 1.2 Statement of the problem.

Kenya continues expanding tea production in an environment of declining world prices and overall tea consumption. Available statistics show Kenya as a country with tea expansion trend in an environment of stagnating prices. Kenya export 95% of its tea production and consumes 5% (Tea Board of Kenya statistics, 2011). The global tea market demand is less than the increasing tea supply coming from the producer countries.

The growth rate in world black tea consumption is expected to reduce from 2.2 percent to 1.2 percent over the period 2003 to 2014. By 2010 Kenya had surpassed its 2014 – projected global tea production. The international community notes that the fundamental oversupply in the world market is likely to persist and prices are likely to remain depressed (FAO, Intergovernmental group on tea, 2005).

Kenya continues to increase its tea output and export against a background of declining global market prices. The country's cumulative local teas consumption for the year 2011 stood at 20,000 tonnes against a production of 377 900 tonnes. During the year 2011, Kenya's tea market share outlet was 95.45% for export and 3.86% for domestic consumption (Tea Board of Kenya statistics, 2011).

Few studies have been done on the socio-economic factors that influence tea production in Kenya by the small holder tea farmer. While previous studies have looked into policy factors influencing tea production in Kenya, they have not investigated other factors that may influence tea production. This study, therefore, seeks to find out the socio-economic factors influencing tea production by smallholder tea farmers, a case of Kirinyaga County.

### **1.3 Purpose of the Study**

The purpose of this study was to investigate the influence of social economic factors on tea production by the smallholder tea farmers in Kirinyaga County.

### **1.4 Objectives of the Study.**

The study was guided by the following objectives:-

- I. To assess how education levels influence tea production by small holder tea farmers in Kirinyaga County.
- II. To establish how availability of farm inputs influence tea production by small holder tea farmers in Kirinyaga County.
- III. To determine how availability of tea market influence tea production by small holder tea farmer in Kirinyaga County.
- IV. To determine how poverty influence tea production by small holder in Kirinyaga County.

### **1.5 Research questions**

The study sought to answer the following research questions:-

- I. How does the education level of small holder tea farmer influence tea production in Kirinyaga County?
- II. How does availability of farm inputs to smallholder tea farmer influence tea production in Kirinyaga County?

III. How does availability of tea market to smallholder tea farmers influence tea production in Kirinyaga County?

IV How does poverty of the smallholder tea farmer influence tea production in Kirinyaga County?

### **1.6 Significance of the Study**

The findings of this study were intended to benefit the smallholder tea farmers in Kirinyaga County when making tea production decisions in the midst of declining World tea prices. The County policy makers and planners will use its findings to put in place social-economic equity measures necessary to mitigate the declining global tea prices. The Kenya tea industry will also use the findings of this study to plan for adequate tea production capacity in the country. The findings and recommendations of this study will be used by the researchers to inquire more on tea production in Kenya, as well as the academicians to understand more on socio-economic factors influencing smallholder tea production in Kenya.

### **1.7 Delimitation of the Study**

This study explored into how farmers' education levels, access to farm inputs, availability of market for tea, and poverty within the tea farmers influenced tea production by the smallholder tea farmer in Kirinyaga County.

### **1.8 Limitation of the Study**

This study was limited to all the 6154 smallholder tea farmers delivering green leaf to all the five tea factory clusters in Kirinyaga County. Challenges in this study included limited time to complete the investigations and scarce funds to cover all the costs. Time was managed by

use of volunteer research assistants who work in the tea factories, who also reduced the total cost of collecting data.

### **1.9 Assumption of the Study**

One major assumption was that all sampled respondents represent the characteristics of all tea farmers in Kirinyaga County. The 72 small holder tea farmers replicated all the 6154 farmers. The respondents were ready to answer the questions and give honest answers to the research questions. The measuring instrument was as accurate as possible. The respondents were cooperative and all the 72 questionnaires were filled and returned.

### **1.10 Definition of significant terms**

- Education Level:** This refers to the length of formal school education, amount of technical training given by extension officers, and on-farm training by factories and/ or extension officers.
- Farm Inputs:** Means that tea farmer can get and afford the desired amount of labour and quantity of weighted fertilizer for tea production.
- Poverty:** Refers to lack of alternative source of income and rigidity to change.
- Smallholder Tea Farmer:** This refers to all tea growers falling under the umbrella of KTDA.

**Social Economic Factors:** These are factors that directly impact on the person and income of the tea farmer.

**Tea Market:** Refers to easily accessible place where the farmer can deliver and sell own tea.

**Tea Production:** Means weighted tea produced by the smallholder tea farmers.

### **1.11 Organization of the Study**

This project report is organized into five chapters. Chapter One consists of the background of the study, statement of the problem, purpose of the study, research objectives, research questions and significance of the study, limitations and basic assumptions. Chapter Two covers literature review which is also divided into various topics. The conceptual framework is provided at the end of the chapter linking the independent and dependent variables of the study. Chapter Three constitutes the research methodology, which is divided into research design, target population, sample and sampling procedure, research instrument, data collection procedure and data analyses techniques.

Chapter Four constitutes of data analysis, presentation and data interpretation. It is divided into four sections; farmers' education level, availability of farm inputs, availability of market for tea and poverty profile. And finally chapter Five constitutes of discussion, conclusion drawn, recommendations made and suggestions for further research.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

The following literature review looks into the theoretical frame work as explained by the cob web theorem in relation to agricultural markets. Paulo Freire, philosophy of human consciousness into the domain of rural extension in reference to agrarian reform was also reviewed. The literature also brought out the international views on tea production in Africa and Kenya in particular. Kenya's tea production scenario was analysed in the light of Tea Act as interpreted by the regulatory body, The Tea Board of Kenya (TBK). Tea production theoretical frame work was also evaluated as expounded by the Tea Research Foundation of Kenya (TRFK) and the Kenya Institute for Public Policy Research and Analysis (KIPPRA). The available literature on research helped to develop the four research questions for this study. Four study variables namely farmers' education level, farm inputs, market and poverty level were identified and discussed. The Legal and Policy framework was looked at as a moderating factor in tea production while weather is mentioned as an extraneous factor. Finally, a conceptual frame work for the study was developed to explain the relationships of the dependent and independent variables.

Available literature indicated that, at international level, Kenya is viewed as a big black tea producer and exporter, thus contributing to glut in the world market. Kenya exports about 95% and only consumes 5% of its total tea locally. The Kenyan tea farmer was unhappy with the current level of tea returns.

The world concern is to control oversupply of tea in the world market in order to tame the depressed prices. (Food And Agricultural Organization funded Intergovernmental Group meetings on Tea, 2005).

While a lot of tea research work had been directed to scientific enquiry very little had been done on socio-economic factors influencing tea production in Kenya. The literature also looked into farmer's on-farm education in Kenya and how it is viewed by various scholars. Earlier works by Owour, Kavoi and Siele postulated that Kenyan tea farmer as somebody requiring a lot of constant technical assistance to enhance tea production. Little work had been done on the socio-economic threshold of increased tea production in relation to prices. Hence this study was intended to add knowledge on the socio-economic factors influencing tea production in Kenya.

While a good amount of scientific work had been carried out on the effects of different types of fertilizer and rates on tea production, little has been done on the socio-economic influences of labour and fertilizer as inputs to tea production. Hence one of the research questions of this survey was how does labour and fertilizer as farm inputs influence tea production in Kenya.

There has been limited research on the socio-economic factors influences on the tea market and financial returns on tea production. Documented work was evaluated in the following literature review. The farmer's perception of both the market and level of payments required to be established.

The literature review also analyses the legal and policy framework as a moderating variable, and weather as extraneous variable in tea production. The literature also looked at the theoretical scientific tea production frame work as is represented by the Tea Growers

Handbook. The following literature review shows how the research questions for this study were developed. Finally, a conceptual framework for this study was formulated. It is also apparent that the Kenya tea industry does little to monitor supply and demand trends in the world tea market, and appropriately advice the smallholder tea farmers on the optimum production levels. This study intended to close these gaps by availing information on the socio-economic factors influencing tea production by smallholder tea farmers to the tea industry.

The TRFK Tea growers' hand book gives a good deal of emphasis on the agronomic aspects of tea production in Kenya. It does not address the social-economic equity aspects of tea production at local level. While the book looks at the smallholder tea farmer as somebody requiring technical information and assistance on how to enhance tea production, it ignores the critical balancing of social-economic environment of tea production. Therefore, in order to avail more information to the tea industry to help mitigate on social-economic equity, this study was developed.

## **2.2 Theoretical framework**

The following looks into cobweb model of agricultural production, Freire model of extension education and subsequent model presentation by Kenya Institute of Policy Research and Analysis. The Tea Board of Kenya and Tea Act have also contributed to existing models as relates to tea growing in Kenya.

### **Cobweb model**

This is an economic model that explains why prices might be subject to periodic fluctuations in certain types of markets. It describes cyclical supply and demand in a market where the

amount produced must be chosen before prices are observed. Producers' expectations about prices are assumed to be based on observations of previous prices. The cobweb model is based on a time lag between supply and demand decisions. Agricultural markets are a context where the cobweb model might apply, since there is a lag between planting and harvesting (Kaldor, 1934). Suppose for example that as a result of unexpectedly bad weather, farmers go to market with an unusually small crop. This shortage, equivalent to a leftward shift in the market's supply curve, results in high prices. If farmers expect these high price conditions to persist, then in the following year, they will raise their production of that particular crop relative to other crops. Therefore when they go to market the supply will be high, resulting in low prices. If they then expect low prices to continue, they will decrease their production of that particular crop on the coming year, resulting in high prices again. As this process repeats itself, oscillating between periods of low supply with high prices and then high supply with low prices, the price and quantity trace out a spiral. They may spiral inwards, in which case the economy converges to the equilibrium where supply and demand crosses; or they may spiral outwards, with the fluctuations increasing in magnitude.

Simplifying, the cobweb model can have two main types of outcomes: If the supply curve is steeper than the demand curve, then the fluctuations decrease in magnitude with each cycle, so a plot of the prices and quantities over time would look like an inward spiral. This is known as the stable or convergent case. If the slope of the supply curve is less than the absolute value of the slope of the demand curve, then the fluctuations increase in magnitude with each cycle, so that prices and quantities spiral outwards. This is known as the unstable or divergent case. Two other possibilities are: Fluctuations may also remain of constant magnitude, so a plot of the outcomes would produce a simple rectangle, if the supply and

demand curves have exactly the same slope (in absolute value). If the supply curve is less steep than the demand curve near the point where the two curves cross, but more steep when we move sufficiently far away, then prices and quantities will spiral away from the equilibrium price but will not diverge indefinitely; instead, they may converge to a limit cycle.

In the extension or communication essay, Paulo Freire, internationally renowned educator, applies his philosophy of human consciousness into the domain of rural extension in Latin America. Specifically, he refers to agrarian reform to explain how "extension" is contrary to "communication", thus incomparable with education. Education, according to Freire, is for the purpose of humanizing others through conscious action for the purposes of transforming the world. Freire begins with a semantic analysis of the word "extension". He specifically focuses on its usage as extending something to. The role of the extension agent is construed as extending one's knowledge and technical capacities. As opposed to directly improving a given situation, extension, like communication, involves other people and their relationship with the world in order for them to change the world. He analyzes the meanings of extension, and explains that those who extend are imposing their understanding of reality upon another. While others might argue that extension is educative, Freire disagrees. He refers to associative fields, which are associative relationships within the field of meaning of words. Freire also discusses reasons for resistance to new knowledge. He focuses on the peasant community and magic aspects of their culture. Superimposing another thought stimulates a natural defensive reaction of mistrust and rejection. New techniques and ideas have tremendous implications on changes in the culture, including language and social perceptions.

Therefore, Freire stresses the importance of the educator to be familiar with and involved in the learner's view of the world. What may appear as a physical problem to the observer may be of deeper cultural meaning to the learner. Wrongful extension comes into play when the observer superimposes his/her own equally cultural perception upon the other. Again this begs the question, can't the act of communication itself be viewed as offensive to a culture? And if it is deemed as offensive, would Freire suggest forcing dialogue? Freire responds to another critique regarding the impossibility of communication on scientific or technical information. In retort, he states that the methods of dialogue are to include a confrontation of technical knowledge to their physical reality in its relation to their lives. In terms of agrarian reform, Freire stresses the inter mix of technology and culture. Technical trainers become agents of change as they participate in relationships with human beings and nature. In his own words, "all development is modernization, not all modernization is development" (p. 130).

Tea growers' handbook (1985), which is a compilation of the Tea Research Foundation of Kenya's (TRFK) recommendations for tea production, is intended for use as the standard book of reference for tea growers in Kenya (TRFK, 1985). The theory behind this hand book is that, if a tea grower refers and practices what is recommended therein, tea production would be maximized. The book discusses and offers scientific solutions on how to maximize tea yields. However, it gives little information on the social, economic and environmental equity on tea production

The Kenya Institute for Public Policy Research and Analysis (KIPPRA), an autonomous institute that conducts public policy research, leading to policy advice to the government, in

the year 2000 recommended the following measures that were adopted to enhance tea production in Kenya, which led to a paradigm shift.

In a liberalised economy, the TBK should regulate the industry, as stipulated in the Tea Act (CAP 343), but licensing of growers, manufacturing and marketing agencies should be done away with, thus allowing the board to deal only with registration, monitoring and ensuring a level playing ground for all players. This liberalisation strategy was intended to stimulate increased tea production.

From the factory to tea auction market, tea marketing should be the responsibility of the Kenya Tea Development Agency (KTDA) as a commissioned management agent, to maintain quality control and as an incentive to reduce losses. The problems with the KTDA operation systems are poor coordination and supervision of tea collection and processing; uneven distribution of information regarding tea marketing earnings and transfer of ownership. KIPPRA normally produces a body of well researched and documented information on public policy, and in the process it assists in formulating long term strategic perspectives.

### **2.3 World and tea production**

World black tea production was projected to grow by 1.7 % annually from 2003 to reach 2.7 million tonnes in 2014, mainly due to improved yields as a result of high uptake of good agricultural practices (GAP) by farmers among countries in Africa. A significant growth in output was expected as tea bushes reached optimum producing age and smallholder skills were to be maximized through intensive capacity building. Tea harvested in the largest producing country like Kenya was expected to grow by 2.4 % annually to reach 379 000 tonnes in 2014 (FAO Intergovernmental meeting on tea, 2005).

While some countries, like Indonesia, North India and Malawi did not conform to these global projections, Kenya continued expanding its tea output (Table 1.1). By the year 2010, Kenya had surpassed the global projection of 2014 and reached a production of 399,000 tonnes. It would be the interest of this study to investigate social economic factors that influence tea production by the smallholder tea farmer. The growth rate in world black tea consumption was expected to be reduced from 2.2% over the last decade (1993-2003) to 1.2% over the next decade (2004 - 2014) to reach 2.67 million tonnes by 2014. This would translate to a reduction of the Kenyan tea global market share. Kenyan exports 95% of its total tea. It was the interest of this study to assess the smallholder tea farmer perception on the level of returns.

#### **2.4 Farmers education and tea production**

Paulo Freire, an internationally renowned educator, applies his philosophy of human consciousness into the domain of rural extension in Latin America. Specifically, he refers to agrarian reform to explain how "extension" is contrary to "communication", thus incomparable with education. Hence one objective of this study is to enquire into how education level of smallholder tea farmer influences tea production in Kirinyaga County. Impact of education, according to Freire, is for the purpose of humanizing others through conscious action for the purposes of transforming the world. In his analysis, Freire makes some assumptions that warrant further discussion. First, all recipients of extension, according to Freire's own definition of extension, farmers are demeaned as not only passive, but incapable of questioning. His definition of the term 'extension' assumes an inability of the recipients to choose to adopt or to refuse new knowledge. This study will attempt to establish whether this applies to Kirinyaga tea farmers.



Freire also discusses reasons for resistance to new knowledge. He focuses on the peasant community and magic aspects of their culture. Superimposing another thought stimulates a natural defensive reaction of mistrust and rejection. Freire stresses the importance of the educator to be familiar with and involved in the learner's view of the world. What may appear as a physical problem to the observer may be of deeper cultural meaning to the learner. Wrongful extension comes into play when the observer superimposes his/her own equally cultural perception upon the other. Again this begs the question, can't the act of communication itself be viewed as offensive to a culture? And if it is deemed as offensive, would Freire suggest forcing dialogue? Freire responds to another critique regarding the impossibility of communication on scientific or technical information. In retort, he states that the methods of dialogue are to include a confrontation of technical knowledge to their physical reality in its relation to their lives. In terms of agrarian reform, Freire stresses the inter mix of technology and culture. Technical trainers become agents of change as they participate in relationships with human beings and nature. In his own words, "all development is modernization, not all modernization is development" (p. 130).

A study by Owour, Kavoi and Siele found that the extension staff recognised the need to have extension courses for the farmers. Their study on how extension staff perceived policies influencing tea production and extension activities concluded that the staff's impact could be enhanced through administration of regular courses to the extension staff. The staffs were supposed to transmit the education received down to the farmers. According to Freire, the role of the extension agent is construed as extending one's knowledge and technical capacities. This study will explore whether farmers in Kirinyaga County receive tea related trainings. It is also important to establish whether there exists a training program for the

farmers. The scholars also observed that in the smallholder tea sub sector, production is heavily dependent on appropriate production technologies reaching the farmers, especially the farm operators.

On the extension policy, the researchers pointed out that, a policy that is user friendly is a pre-requisite for ease of adoption. Instances where policies tend to be autocratic normally meet weak acceptance or face rejection. This study seeks to establish how the technologies reach the farmers and how they influence tea production.

Their study also found out that, the description by majority of the tea extension staff suggested that there was an urgent need to restructure the extension system so that it is both staff and farmer friendly. This study intended to establish whether the current extension system influence tea production.

## **2.5 Farm inputs and tea production**

On a qualitative study on extension service knowledge and farm adoption levels Owour, Kavio and Siele, (2001), postulated that fertilizer application was one technology which ensured farmers get higher production. This study would like to establish how fertilizers influence tea production. Do farmers rely on fertilizers alone for their tea production? It would similarly be interesting to assess whether this fertilizer is readily available when and in quantities required by the farmers. The Tea Handbook, (1985) contends that if a farmer uses fertilizer and harvest tea at regular intervals, yields are likely to increase.

This study intended to assess how the two key farm inputs, namely fertilizer and labour, influence tea production by smallholder tea farmer in Kirinyaga County.

## **2.6 Tea Market and tea production**

In 2005, world tea market projections indicated an increasing imbalance between tea supply and demand amounting to 98 000 tonnes. The growth rate in world black tea consumption was expected to reduce from 2.2% over the period 1993-2003 to 1.2% over the next period 2003 to 2014. The main reason being the slow-down in consumption in producing countries, as the production growth rate outpaces the growth in demand for exports (FAO, Intergovernmental group on tea, 2005). The available literature indicates that Kenya Tea Development Agency Limited (KTDA) is responsible for leaf collection, processing and marketing on behalf of the smallholder tea farmers. It was the interest of this study to find out how the market and marketing influence tea production by the smallholder tea farmer in Kenya.

### **2.6.1 Local black tea consumption**

In Kenya, the cumulative local tea consumption for the year 2011 stood at 20 000 tonnes out of the total production of 377 900 tonnes (Tea Board of Kenya Statistics). This greatly contrasts with India, where out of about 960,000 tonnes produced annually, and local tea consumption accounts for about 805,700 tonnes. It will be seen that Kenya relies heavily on the world tea market and the global views on local tea production should be noted. The available literature showed that Kenya's tea production was on upward trend (Tea Board of Kenya publications). This study intended to establish those factors that influence tea production in Kenya.

### **2.6.2 Global Net tea imports**

Kenya, being a net tea exporter and therefore prone to world price fluctuations, should not close its ears to global concerns. World net imports of black tea, a proxy for consumption in importing countries, were projected to increase annually. Food and Agricultural Organization (2005) note that, though in 2014, the quantity of black tea consumed in producing countries is expected to grow by 1.3 percent per year to reach 1.33 million tonnes, producing countries are projected to consume only 49 percent in 2014, adding to the demand and supply imbalance.

The largest increase in domestic consumption would occur in the Far East, as tea-producing countries in Africa are expected to continue to export most of their output. Domestic consumption of black tea in Kenya is expected to grow at 1.2 per cent to reach 6.2% by 2014. Domestic consumption of black tea in India is expected to increase by 1.5 percent annually to reach 80 percent of the tea produced in that country by 2014.

### **2.6.3 Global tea exports**

World black tea exports were projected to reach 1.3 million tonnes in 2014, reflecting an average annual increase of 1.4 percent per year from 2003. About half of the increase would originate in Africa, where production is likely to continue to grow while domestic consumption remains small. The region's total black tea exports were projected to amount to 518 000 tonnes by 2014. Exports from Kenya would increase by 2.7 percent annually to reach 358 000 tonnes in 2014, giving Kenya a 27 percent share of the global black tea export market.

In the year 2010, Kenya exported 441 000 tonnes of black tea, surpassing its projections. It will be recalled that while the global community is an easy with low tea prices, Kenya is equally not comfortable with its reduced tea prices in the middle of increasing costs of production. What, then, are some of the factors that influence tea production by smallholder tea farmer in Kenya?

#### **2.6.4 World tea supply and demand**

In the medium-term, the projections indicated an increasing imbalance between supply and demand of 98 000 tonnes. However, if the projected imbalance was to be realized then further weakening in prices would be expected. In terms of profitability, a major concern was the rising cost of production, which could only be minimally reduced by increasing mechanization as the scope was limited if quality was to be maintained. The preferred solution must lie in stimulating demand. With these remarks, one would wonder how the tea market influences tea production in Kenya.

#### **2.7 Poverty and tea production**

Chamber looks at physical causes of poverty as lack of food, shelter, water and clean air. People need an environment that supports life, and, if money, land and livestock are largely absent poverty is the result. The physical causes of poverty are intensified by the social causes of poverty (Wolterstorff, 1983). There are large scale social practices and a whole system of social roles, often firmly approved by the members of the society generally that cause or perpetuate injustice and misery. This study inquired into how alternative sources of income and or fear to change, influenced tea production in Kirinyaga County.

## 2.8 Legal and policy framework

In its policy paper No.1 of 2000, Kenya Institute of Public Policy Research and Analysis (KIPPRA), which serves as a centralised source from which the government and the private sector may obtain information and advice on public policy issues has identified laws that govern the tea industry. The specific laws governing the tea industry are spelt out in the Tea Act (chapter 343) and the Kenya Tea Development Authority (KTDA) Order established under the Agriculture Act (CAP 318) to control and regulate small holder tea.

Tea Board of Kenya (TBK) remains the regulatory body of the industry, and still intact are its restrictive powers over entry and exit into the industry through licensing of tea growers and factories. This can create monopolies in providing services to growers. In restructuring KTDA, efforts were made to privatize its functions, give more power to farmers in running factories and provide farmers with production and processing services. However, KTDA still dominates in delivering such services as supplying inputs, collecting and processing green leaf marketing tea and making payments to farmers. It has established itself in the world tea market and can benefit farmers by ensuring easy access to markets. Problems with the KTDA system are poor coordination and supervision of tea collection and processing; uneven distribution of information regarding tea marketing, earnings and transfer of ownership; and significant risks in transfer of ownership, whereby farmers bear the brunt of the risks and costs. The major tea market is the Mombasa auction. Major buyers are Pakistan, the United Kingdom, Egypt and the Middle East, but the potential markets elsewhere have not been exploited adequately. Selling tea in bulk without adding value through branding and packaging, limits earnings from exports (KIPPRA, 2000). Estimates indicate earnings could be increased up to six times if this were done.

The average tea yield on smallholder farms has stagnated and sometimes declined due to minimal husbandry, problems with collecting the tea due to poor roads infrastructure, low payments, and politicking among farmers. Controversies about KTDA over its efficiency in delivering services and privatizing it have made the problem worse.

## **2.9 Weather**

The optimum soil water, soil and air temperatures determine tea plant growth and consequently its yields. Some implications of climate change to tea include mean air temperature whose increase is likely to affect tea production by causing change in the growth cycles of plants through increased temperature stress. Consequently harvest times and quality of produce may change. Increased humidity levels and evapo-transpiration, lower soil moisture levels hence increased water stress on plants resulting in lowering of yields.

Rainfall changes and or shifts in rainfall seasons increases or lowers tea production. Since most of the Kenyan tea relies heavily on rain-fed farming, climate change coupled with the ever increasing rainfall variability will affect the production. Climate change adaptation projects are being undertaken in the country on many socio-economic sectors including agriculture.

## 2.10 CONCEPTUAL FRAMEWORK

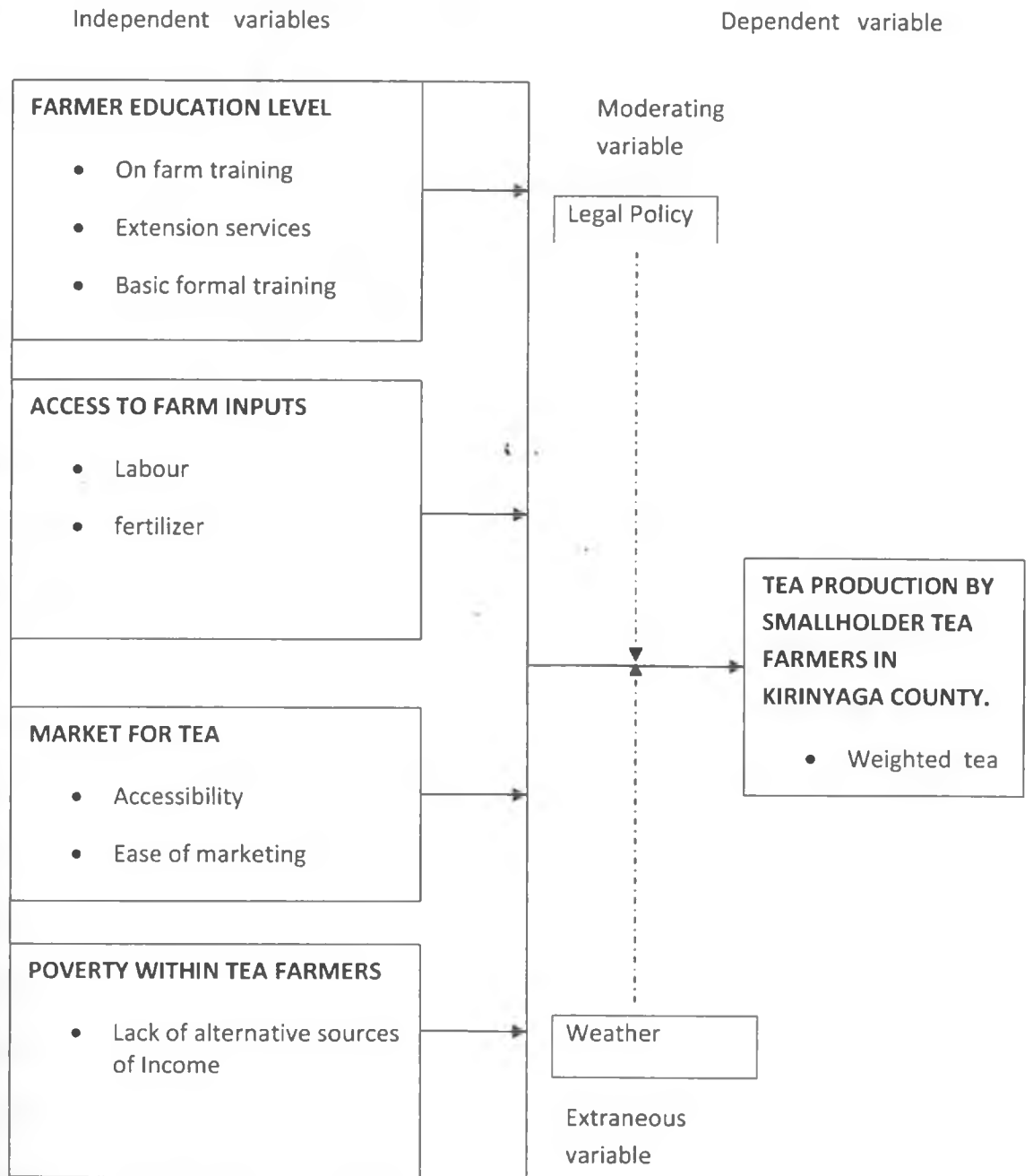




Figure 2.10 conceptualizes how the identified independent variables relate to tea production, the dependent variable. Legal policy and weather act as moderating and extraneous variables respectively. Farmers' educational level, access to farm inputs, market and poverty were thought to influence tea production by the smallholder tea farmer.

## 2.11 Summary

The literature reviewed available information on tea production. Literature at global and local level was reviewed and discussed. The literature brought out a world concerned with an oversupply of tea, declining consumption and depressed tea prices. The world looked at Kenya as oversupplying tea into the world market. Locally, Kenya continued with rapid tea expansion in an environment of reducing world tea prices and low domestic consumption at 5%. The smallholder tea farmer in Kenya was noted to be discontented with the low tea prices, and at the same time continues increasing tea output. This helped to conceptualize the factors that influence tea production by the smallholder tea farmer in Kenya. The literature also looked at existing works by earlier scholars and identifies information gap on socio-economic factors influencing tea production in Kenya. The literature review helped in identification of four research questions. Very little research work has been done on social-economic factors influencing tea production. Therefore, four research variables were developed in the course of literature review to guide this study. The four main variables, namely farmers' education levels, farm inputs, market and poverty were discussed. Legal and policy framework as contained in the Tea Act and KTDA Order Paper are highlighted as moderating variable. Climate is mentioned as extraneous variable. The theoretical framework surrounding tea production and trade in Kenya was also discussed. A conceptual framework was finally developed to help find answers to the four research questions.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

In this chapter, the appropriate research design was identified and stated. Area of study and the target population to be studied were brought out. The desired sample size was identified by use of proven method. The sampling frame was explained. Data collection instrument, whose validity and reliability was ensured, was also explained. Operationalization of variables to be used in the study was provided.

#### 3.2 Research Design

Descriptive survey design was used for inquiring into social economic factors influencing tea production by the smallholder tea farmer in Kirinyaga County. This survey study assessed the stated variables and their influence on tea production. Kombo and Tromp, 2006 argues that a survey design is appropriate for collecting, classifying, analysing, comparing and interpreting data. Both quantitative (numbers) and qualitative (words) research methods can be used to complement each other (Mahotra 1993; Morgan 1988; Perry 1988). The interaction between the variables of this study were investigated through a descriptive survey.

#### 3.3 Target Population

This study targeted 6154 smallholder tea farmers delivering green leaf to all the five tea factory clusters in Kirinyaga County.

### 3.4 Sample size and Sampling Procedure

The sample size in this study was determined through approach based on precision rate and confidence level as recommended by Kothari (1984, pp175-180). In this study I sampled from a finite population, hence the formula to be used according to Kothari was:

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2 (N-1) + z^2 \cdot p \cdot q}$$

Where:

n= desired sample size

$z^2$ = is the standard variate at the required confidence interval (C.I).

p= is the sample proportion in the target population estimated to have the characteristics being measured.

q= 1-p

N=size of the target population

$e^2$ =acceptable error (the precision)

In this study I used confidence interval of 95%, P value of 0.05 ( $p = 0.05$ ) and acceptable error (the precision) of 0.05 ( $e = 0.05$ ). Z was 1.96 as per table area under normal curve for the required C.I of 95% and N was 6154, number of registered tea farmers in Kirinyaga County.

Therefore, the desired sample was

$$n = \frac{(1.96)^2(0.05)(1-0.05)(6154)}{(0.05)^2(6154-1) + (1.96)^2(0.05)(1-0.05)}$$

$$n = \frac{1122.957304}{15.3825 + 0.182476}$$

n=  $\frac{1122.957304}{15.564976}$

15.564976

n=72.2 ~ 72 tea farmers

### **3.5 Data Collection Instruments**

A standardised questionnaire to cover all the 72 sampled respondents was used. In order to cover all areas of interest, both open and closed ended questions were used. The standard questionnaires were administered by interviewers to the respondents. Questionnaires are commonly used to collect important information about a population (Mugenda, 1999). Each item in the questionnaire was tailored to address a specific research question.

### **3.6 Instruments validity**

The questionnaire was given to some professionals who included my supervisor to critique it. The professionals suggested the necessary areas to change in order to establish the content validity of the instrument. This study finally developed a copy of a more improved questionnaire. It was ensured that the structured questionnaire remains focused, accurate and consistent with the study objectives.

### **3.7 Instrument reliability**

The questionnaire was initially administered to 10 respondents. Another 10 respondents were randomly picked after one week and similar questionnaires used to collect data. The responses were summarised and compared to the earlier ones. Comments made by the respondents during piloting were used to improve on the instrument. After the piloting the questions in the questionnaire were assessed and those found not to be clear were reframed for clarity. The questionnaires were developed such that they yielded similar results.

### 3.8 Data analysis techniques

After data collection, the questionnaires were sorted out and edited in order to detect any inconsistencies during data collection. Data coding was done by creating dummy variables names. These entire dummies were in turn assigned numeric values (ordinal scales) that could be computed by Statistical Package for Social Scientist (SPSS) software. Data cleaning was done whereby the data file was finally checked for accuracy and completeness. This was followed by data entry according to the assigned codes. The keyed in data was subjected to SPSS processor, which computed the data and results. The output results were used to draw conclusions in relation to the research questions.

### 3.9 Operationalization of variables

Objective	Variable	Indicator(s)	Measurement	Scale	Data collection method	Data analysis
To assess how education levels influence tea production	<u>Independent variable.</u>  Farmer Education level	Formal education.  Training by extension officers  On farm training by factory	Years of schooling.  Number of annual training courses attended.  Number of trainings by factory.	Ordinal	Interview guide	Descriptive statistics

To establish how farm inputs influence tea production	<u>Independent variable.</u> Farm inputs used in tea	Fertilizer amount. Plucking labour.	Bags of fertilizer received. Man days available	Ordinal	Interview guide	Descriptive statistics
To determine how market for tea influences tea production	<u>Independent variable</u> Market for tea.	Delivered weights	Kilograms of tea sold	Ordinal	Interview guide	Descriptive statistics
To inquire how poverty influence tea production	<u>Independent variable.</u> Poverty within tea farmers.	Other source of income. Shift in tea farming	Other commercial farm enterprises. Other income generating crops.	Ordinal	Interview guide	Descriptive statistics
Social-economic factors influencing tea production	<u>Dependent variable.</u> Tea production by smallholder tea farmer.	Produced weighted tea	Tons of tea.	Ordinal	Literature review	Descriptive statistics

Table 3.8 gives the operational definition of variables used in this study. The table has provided the indicators and measurement for independent variables namely, farmers education level, farm inputs used in tea, market for tea and poverty within tea farmers. The indicator and measurement for dependent variable, namely, tea production by smallholder tea farmer are also given. Both measurement scales and the data analysis method to be used are explained.

### **3.10 Summary.**

Various research methodologies were reviewed and a descriptive research design method was selected as appropriate for this study. The target a population was 6154 smallholder tea farmers. A representative sample size of 72 respondents was selected using Kothari formula. Stratified random sampling, as explained by Mugenda, 1999, was used to sample the desired respondents. As this was basically a case study, research questions were articulated to formulate a structured questionnaire, which was designed as the principal data collection instrument. The validity and reliability of the questionnaire was ensured to minimize errors during data collection. The desired enquiries, based on the variables of study, were to understand and describe the social economic factors influencing tea production by the smallholder tea farmer in Kirinyaga County. Data collected was sorted, cleaned, edited, and coded, keyed in the computer and processed using descriptive statistics for output results. SPSS software was used to analyse and present the results. Conclusions and recommendations were then drawn and made respectively.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.1 Introduction

This chapter presents the summary of the analysed data. The results are presented based on the objectives of the study, which is aimed at investigating the influence of socio-economic factors on tea production by the smallholder tea farmers in Kirinyaga County. In order to put the results of the study into perspective, the findings were organised under the following categories; farmers education level, farm inputs, tea market and poverty profile. The data was analysed using descriptive statistics by use of Statistical Package for Social Scientist software (SPSS). The data analysed is tabulated using frequencies and percentages.

#### 4.2 Questionnaires return rate

All the 72 questionnaires given out were returned, thus representing 100% response. According to Peil (1995), questionnaires return rate of above 50% is considered good for a study.

#### 4.3 Farmers' education level

This section presents the analysis and interpretation of the data on formal education, informal education, number of training sessions attended by the farmers and the rating of the training sessions.



### 4.3.1 Formal education

The following were the analysed responses.

**Table 4.1 Distribution of tea farmers levels of formal education**

<b>Education level</b>	<b>Frequency</b>	<b>Percent</b>
Primary	29	40.3
Secondary	36	50.0
Tertiary	6	8.3
None	1	1.4
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.1 presents levels of formal education for tea farmers. It indicates that 98.6% of the Farmers had formal education. Almost all the tea farmers in Kirinyaga County are literate. An insignificant 1.4% of the farmers did not have some form of formal education. This means that the farmers were adequately educated to receive tea production information.

### 4.3.2 Informal education

**Table 4.2 Distribution of tea farmers training by agricultural extension on tea production**

Training	Frequency	Percent
yes	61	84.7
no	11	15.3
Total	72	100.0

Table 4.2 shows that 84.7% were trained by the Agricultural Extension Officers in the past one year. This indicates that a high group of farmers had received extension training from Agricultural Officers to enable them carry on with tea production activities. This may have helped them to raise their tea productivity.

#### 4.3.3 Number of training sessions

Table 4.3 shows the number of tea production training sessions that were conducted by Agricultural Extension Officers.

**Table 4.3 Distribution on number of times tea farmers were trained on tea production last year**

Training	Frequency	Percent
once	9	12.5
twice	23	31.9
thrice	22	30.6
more than thrice	10	13.9
none	7	9.7
Non response	1	1.4
Total	72	100.0

Table 4.3 shows that 76.4% of the tea farmers had attended at least two trainings while 88.9% had attended at least one training. This high number of growers attending training sessions could have translated to increased tea productivity by the farmers. A small number of growers, which comprised of 9.7%, had not been trained on tea production. However their tea productivity was insignificant and could not check the increasing tea production in Kirinyaga County.

#### 4.3.4 Rating of the number of training sessions

**Table 4.4 Distribution on the rating of the number of annual trainings given to tea farmer**

Rating	Frequency	Percent
not enough	32	44.4
enough	36	50.0
more than enough	2	2.8
excessively many	1	1.4
Non response	1	1.4
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.4 indicates that 54.2% of the farmers felt that the number of annual trainings were enough. 44.4% of the farmers wanted the number of trainings to be increased. They latter group of farmers were of the opinion that the number of sessions was not enough. This high yearning for more training could be an indication that tea farmers valued the trainings in relation to increased tea production.

#### 4.4 Farm inputs used

This section presents the analyses and interpretation of responses on fertilizer and labour being inputs used in tea production.

#### 4.4.1 Fertilizer application

**Table 4.5 Distribution of tea farmers application of fertilizers**

Application	Frequency	Percent
yes	71	98.6
no	1	1.4
Total	72	100.0

Table 4.5 indicates that 98.6% of the farmers applied fertilizer to their tea. A high number of farmers use fertilizer in their tea production. This high used of fertilizer by the farmers may have contributed to the increased tea production. Tea plants normally likes soil nutrient replenishment for sustained and increased yields as expounded by tea research Foundation of Kenya.

#### 4.4.2 Number of bags of fertilizer applied

**Table 4.6 Distribution of the number of fertilizer bags applied by tea farmers per year**

Fertilizer	Frequency	Percent
1-4 bags	52	72.2
5-10 bags	15	20.8
11-15 bags	1	1.4
Non response	4	5.6
Total	72	100.0

Table 4.6 shows that 94.4% of the farmers applied a certain amount fertilizer to tea. Majority of the farmers use fertilizer to produce tea. The varying number of fertilizer bags used to produce tea may be due to the differing farm sizes.

#### 4.4.3 Adequacy of fertilizers

**Table 4.7 Distribution of tea farmers response to amount of fertilizer adequacy**

Adequate	Frequency	Percent
yes	52	72.2
no	19	26.4
Non response	1	1.4
Total	72	100.0

Table 4.7 portrays that majority of the farmers felt that the amount of fertilizer available to them is adequate. Few farmers expressed that the fertilizer available to them was not enough. The 26.4% group that felt the fertilizer was not adequate could require further investigation to establish the reasons why, as all the farmers were found to use fertilizer.

#### 4.4.4 Ability to purchase fertilizer

**Table 4.8 Distribution of farmers ability to pay for fertilizer**

Ability	Frequency	Percent
yes	58	80.6
no	8	11.1
Non response	6	8.3
Total	72	100.0

Table 4.8 indicates that 80.6% of the farmers were able to pay for their fertilizer. Few farmers could not afford to pay for their fertilizer. This high level of fertilizer affordability meant that farmers were motivated to apply fertilizer and hence increase tea production.

#### 4.4.5 Availability of fertilizers

**Table 4.9 Distribution of tea farmers response on timely availing of fertilizer by factories**

Timely	Frequency	Percent
yes	44	61.1
no	27	37.5
Non response	1	1.4
Total	72	100.0

Table 4.9 shows that majority of the farmers receive fertilizer on time, while relatively few farmers receive their fertilizer late. 61.1% of the farmers were able to synchronise their operations with the time of fertilizer arrival and 27% were unable. All the same, the overall tea production was on an upward trend in the County.

#### 4.4.6 Number of pluckers

**Table 4.10 Distribution of the number of pluckers normally engaged per month farmers**

	Frequency	Percent
1-5 workers	54	75.0
6-10 workers	8	11.1
Non response	10	13.9
Total	72	100.0

Table 4.10 indicates that 86.1% of the farmers engage labour on their farms. Very few farmers do not engage labor. The 13.9% who did not respond may be using family labor

which they could not consider as hired labor. All the farmers were found to use labor on their farms.

#### 4.4.7 Adequacy of labour

**Table 4.11 Distribution of farmers response on labour adequacy**

Adequate	Frequency	Percent
yes	54	75.0
no	12	16.7
Non response	6	8.3
Total	72	100.0

Table 4.11 shows that 75% of the tea farmers felt that the labour they got to pluck tea was adequate. The 16.7% of farmers who felt that labor they got was not enough, may have suffered during high crop. However this did not affect the overall tea production increment in the County.

#### 4.4.8 Ability to pay for labour

**Table 4.12 Distribution of tea farmers ability to pay for farm labour**

Ability	Frequency	Percent
yes	58	80.6
No	8	11.1
Non response	6	8.3
Total	72	100.0

Table 4.12 shows that 80.6% of the farmers were able to pay for their engaged labour. Very few could not afford to pay. The 11.1% who replied no probably used family labour to carry on their farm operations. The 8.3% no response were probably undecided what say.

#### 4.4.9 Availability of labour

**Table 4.13 Distribution of tea farmers response on labour availability**

Availability	Frequency	Percent
yes	40	55.6
no	26	36.1
Non response	6	8.3
Total	72	100.0

Table 4.13 shows that 55.6% of the farmers had access to readily available labour, while a good number had problems with plucking labour when it was required. 36.1% of the farmers could not carry on farm operations when they required due non availability of ready labour.

#### 4.5 Market for tea

This section tabulates the analyzed data on tea market and interprets it.

##### 4.5.1 Awareness of market

**Table 4.14 Distribution of tea farmers awareness on glut in tea market**

Aware	Frequency	Percent
yes	39	54.2
no	30	41.7
Non response	3	4.2
Total	72	100.0



Table 4.14 shows that quite a number of tea farmers are not aware that tea market was flooded, with 54.2% of the respondents being aware of the glut. 41.7% of the farmers were producing tea without the knowledge that the tea market was flooded. The 4.2% no response probably did not care what was happening to the market so long tea went into the sales.

#### 4.5.2 Tea leaf deliveries

**Table 4.15 Distribution of farmers response on tea leaf deliveries to the factory during the last twelve months**

Delivery	Frequency	Percent
yes	71	98.6
Non response	1	1.4
Total	72	100.0

Table 4.15 shows that of all the farmers interviewed 98.6% delivered their tea leaf to the factories. This was a motivation to continue expanding production and delivering tea.

#### 4.5.3 Reason for not delivering

**Table 4.16 Distribution of farmers response on reasons not to deliver leaf to factory**

No delivery	Frequency	Percent
not applicable	71	98.6
Non response	1	1.4
Total	72	100.0

Table 4.16 portrays that all tea farmers within Kirinyaga County delivered their tea leaf to the factories. This was a good motivation to carry on with tea production, hence tea's increment over the years.

#### 4.5.4 Quantities of tea leaf delivered

**Table 4.17 Distribution of farmers kilograms of tea delivered to the factory last year**

Tea delivered	Frequency	Percent
100-1500 kgs	20	27.8
1600-3000 kgs	20	27.8
3100-4500 kgs	10	13.9
4600-6000 kgs	13	18.1
6100-7500 kgs	3	4.2
7600-9000 kgs	1	1.4
9100-10500 kgs	1	1.4
Non response	4	5.6
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.17 indicates that majority of tea farmers, both with little or much tea, were able to deliver their produce to the factory. Tea production, delivery and collection of any amount could have motivated the farmers to continue with tea expansion activities. An equal in tea collection was observed in all categories of farmers.

#### 4.5.5 Level of satisfaction with tea leaf collection

Table 4.18 Distribution of farmers levels of satisfaction with green leaf collection by the factory

Satisfaction	Frequency	Percent
extremely dissatisfied	4	5.6
Dissatisfied	20	27.8
Neutral	9	12.5
Satisfied	36	50.0
extremely satisfied	2	2.8
Non response	1	1.4
Total	72	100.0

Table 4.18 shows that 52.8% of the farmers are satisfied with tea collection, with a good number, 33.4% being dissatisfied with collection services. The latter group require to be investigated to establish why such a large number of growers were unsatisfied with their tea collection.

#### 4.5.6 Level of satisfaction with tea markets

**Table 4.19 Level of satisfaction with tea markets**

<b>Satisfaction</b>	<b>Frequency</b>	<b>Percent</b>
extremely dissatisfied	5	6.9
Dissatisfied	20	27.8
Neutral	12	16.7
Satisfied	31	43.1
extremely satisfied	3	4.2
Non response	1	1.4
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.19 shows that only 47.3% of the farmers are satisfied with tea market. 34.7% of the farmers were not satisfied. Again it is important to assess the reasons behind the high rate of un satisfaction with the market.

#### **4.6 Poverty**

This section analyses alternative sources of income available to the tea farmer and reasons for producing tea, tabulates the results and interprets the data.

##### **4.6.1 Alternative source of income**

**Table 4.20 Distribution of tea farmers alternative source of income**

<b>Other income</b>	<b>Frequency</b>	<b>Percent</b>
Coffee*	16	22.2
dairy cow	16	22.2
Horticulture	3	4.2

coffee, horticulture	1	1.4
Business	3	4.2
None	15	20.8
coffee,dairy,horticulture	5	6.9
Poultry	2	2.8
Non response	1	1.4
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.20 indicates that 20.8% of the tea farmers rely on tea alone and that 77.8% had another source of income besides tea. The larger group of farmers had diversified to other enterprises. This meant that tea income alone was not enough to the farmers. A larger number of farmers are in tea farming probably due to lack of an alternative.

#### 4.6.2 Why continue to grow tea

**Table 4.21 Distribution of farmers response on continued cultivation of tea**

<b>Reason</b>	<b>Frequency</b>	<b>Percent</b>
lack of better alternative income generating crop	25	34.7
fear to change to unknown	13	18.1
everybody is growing tea	1	1.4
other reasons( source of income)	27	37.5
Non response	6	8.3
<b>Total</b>	<b>72</b>	<b>100.0</b>

Table 4.21 indicates that 52.8% of the farmers produces tea simply because there lacks a better alternative or they fear to shift to unknown. 37.5% are comfortable with producing tea

as a source of income. Majority of the farmers can drift away from tea production, given an alternative.

#### **4.6 Summary of data analysis, presentation and interpretation**

All the questionnaires were returned and the data therein was processed and analyzed using Statistical Package for Social Scientists. The analyzed data was then tabulated using frequencies and percentages. It was finally interpreted.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter highlights the outcome of the investigations of this study in relation to influences of education levels, availability of farm inputs and tea markets, and poverty, to tea production by the smallholder tea farmer in Kirinyaga County. This chapter therefore brings out the summary of key findings, discussions, conclusions drawn, and recommendations made from the analysed results, and shows how these socio-economic variables influence tea production by the small holder tea farmers. Finally, this study suggests areas for further research.

#### 5.2 Summary of findings

From the study it came out that the high level of farmers' education, the availability and usage of fertilizer by a large group of farmers influenced positively the increased tea production. Though plucking labour was inadequate to a few farmers, its availability and affordability was also found to influence accelerated tea production. The tea market was readily available and accessible and this motivated farmers to go on increasing their production. The small holder tea farmers were limited in income generating crops and some were in tea production in order to supplement their sources of income. A good number of farmers were observed to grow tea since they either did not have a better alternative or they feared to shift to unknown.

### **5.2.1 The level of Education**

The findings indicated that a very high number of the farmers in Kirinyaga County have basic formal education. 98.3% of the farmers had at least primary education with only 1.4% lacking formal education. 84.7% of the farmers had been trained on tea production by Agricultural Extension Officers while 15.3% had not. On the number of training sessions conducted on tea production 44.5% of the farmers attended at least three trainings, 44.4% attended between one and two trainings. Only 9.7% of the farmers had not attended trainings that year. 44.4% of the farmers felt that the number of trainings given to them were not enough while 54.4% were satisfied with the number of trainings given.

### **5.2.2 Availability of Farm Inputs**

The results of the study showed that 98.6% of the tea farmers applied fertilizer into tea for production with only 1.4% not applying. 76.5% of the farmers applied 1-4 bags of fertilizer to their farms while 22.2% applied between 5 to 10 bags of fertilizer. Of all the farmers interviewed, 73.2% were contented with the amount of fertilizer issued to them with 26.8% feeling that the amount they got was not enough. 87.9% of the farmers accepted that they were able to pay for their fertilizer while 12.1% said they were unable to pay for the same. On timely availing of the fertilizer, 62% of the farmers felt that tea fertilizer was availed on time, while 38% felt that fertilizer was availed late.

On plucking labour, 87.1% of the farmers engaged between 1-5 workers, while 12.9% used 6-10 persons per month for tea operations. Of all the farmers interviewed, 81.8% felt that the number of workers they engaged on their farms was adequate while 18.2% of the farmers were of the opinion that the labour they got was not enough. 87.9% of the farmers



interviewed said they were able to pay for the labour employed, while 12.1% said that they could not afford to pay for their required labour. 60.6% of the farmers felt that labour was readily available when required, while 39.4% expressed that operation labour was not readily available.

### **5.2.3 Availability of Tea Market**

This study found that 100% of the farmers delivered and sold their tea to the factories. All the farmers delivered their tea to the KTDA tea factories. The farmers were able to deliver between 100 kilograms and 10500 kilograms of tea. 53.5% of the farmers were satisfied with the collection of tea by the factories, while 33.8% were not satisfied. 47.9 % of the farmers were satisfied with the tea market while 35.2% were not satisfied. It also came out that 56.5% of the farmers were aware that tea market was flooded and 43.5% did not know that the market was oversupplied with tea.

### **5.2.4 Poverty Profile**

This study found out that only 21.1% of the tea farmers relied solely on tea. 79.2% of the famers had an alternative farm activity as source of income. Of all the respondents, 37.9% were growing tea since they lacked a better alternative crop and 19.7% were in tea production since they feared to shift to unknown. Only 40.9% produced tea as a means of income.

## **5.3 Discussions of the findings**

This section presents the discussion on the findings of this study.

### 5.3.1 The Level of Education

The high level of formal education within the farmers supplemented with high amounts of on farm trainings may have helped small holder tea farmers to comprehend and effectively accelerate tea technologies uptake. A farmer with formal education can read and understand technological aspects of tea production better. The findings also suggest that majority of tea farmers have access to informal education services provided by agricultural extension officers on tea production aspects. The farmers admitted to have attended at least one training session conducted by frontline Extension agents on tea production. This on-farm tea production related education was observed to influence increased tea production among smallholder tea farmers. Paulo Freire, in his philosophy of human consciousness into the domain of rural extension in Latin America, concurs with this finding of agrarian reform. This is also supported by Owour *et.al* (2000), who postulated that success in farmers knowing, adopting and adapting recommended tea production technologies is largely dependent on the extension system reaching farmers and educating them in ways of improving tea production and productivity. . A large percentage of tea farmers was trained on tea production aspects last year by extension officer implying that technological package on tea production was being disseminated to enhance tea production within the factories catchment.

Half of the farmers interviewed felt that the numbers of annual trainings were enough, while the rest of the farmers wanted the number of trainings to be increased. The latter group of farmers indicated that half of tea farmers in Kirinyaga County feel that given more education they have a room for increasing further their tea production. Paulo Freire states that human development starts with consciousness.

### 5.3.2 Availability of Farm Inputs

A very high number of the farmers applied fertilizer to tea, and use it to produce to get increased production. In their study, Owuor, Kavoi and Siele, (2001), pointed that fertilizer application was one technology which ensured farmers get higher production. This opinion then supports the findings of this study. Fertilizer is one of the most important independent variable in enhancing tea production. Further investigation may be required to establish why an insignificantly small number of the farmers do not apply fertilizer.

The study results indicated that fertilizer and labour inputs are important resources in increased tea production. The results indicated that fertilizer input is easily accessible and available, and as such, not a problem in the tea production system. Most tea farmers applied fertilizer in the range of 1 – 4 bags while a small number apply between 11 – 15 bags of fertilizer. Majority of the tea farmers apply between 1 – 4 bags of fertilizer while 22.1% of tea farmers apply between 5 – 10 bags and only 1.5% apply between 11 – 15 bags. Majority of the farmers felt that the amount of fertilizer available to them was adequate. Few farmers expressed that the fertilizer available to them was not enough. Of the 72 respondent interviewed 73.2% of the tea farmers were of the opinion that the number of fertilizer bags issued to them was adequate, with only 26.8% of the respondents feeling that it was inadequate. The reasons for the 26.8% of respondents, who felt the number is inadequate, require to be investigated.

Majority of the farmers were able to pay for their fertilizer. Few farmers could not afford to pay for their fertilizer. This meant that majority of the farmers were able to use fertilizer in

their tea production. Further inquiry may be required to establish why the 12.1% respondents were unable to pay for their fertilizer.

Majority of the farmers were found to receive fertilizer on time, while relatively few farmers received their fertilizer late. Timely availability of the fertilizer input meant that farmers were able to plan and hence increase tea production. Resources availability and accessibility is a very important component in enhancing tea production (Owuor, 2001). Late fertilizer arrival disrupted farmers production schedule and farm operations.

Majority of the farmers engage labor on their farms while very few farmers do not engage labor. Plucking operation which aims to sell tea for income is a fundamental operation in tea production and it is dependent on labor availability. Most of the farmers engaged labor ranging between 1-5 workers to pluck their tea, while only 12.9% respondents engaged between 6 – 10 workers for the same operations per month. Very few farmers did not answer this question, probably due to misunderstanding, whereby the provision of labour by household members was not considered by the respondents as hired labour; hence 13.9% of the respondents may have thought this question was not applicable to them.

While majority of the tea farmers felt that the labour they got to pluck tea was adequate. 18.2% of the farmers felt that the number of tea pluckers was inadequate to carryout plucking operation in their farms, meaning that the tea fields of the 18.2% respondents were under plucked hence loss of crop and returns. This implies that if the 18.2% respondents can access adequate labour, then total tea output could increase tremendously hence contributing further to oversupply and depressed prices.

Majority of the farmers were able to pay for their engaged labour while very few could not afford to pay. Only 12.1% of tea farmers could not afford to pay for labour input. This group of the tea farmers, who could not engage labour resource in tea production process, were likely to lose tea and returns in the long run.

A good number of the farmers had access to readily available labour, while a good number had problems with plucking labour when it was required. According to the findings, 60.6% of tea farmers were of the opinion that labour resource was readily available while 39.4% are of the opinion that labour resource was not available when required. This scenario has economic implication, in that for the 60.6% tea farmers, because labour resources is readily available they can bid downwards for the wages hence reduce their costs of production while for the 39.4% respondent, the forces of supply and demand in the labour market will make the wages demanded by labour resource to go up because of its scarcity while its demand is high hence making the cost of production of the 39.4% tea farmers to increase. The cob web theorem attests to this.

### **5.3.3 Availability of Tea Market**

The study results indicate that all the farmers sold their tea leaf to the contracting factories. All the tea farmers, both with 100 kilograms or 10500 kilograms of tea, were able to deliver their produce to the factory. Majority of tea farmers interviewed delivered tea leaf ranging between 100 – 1500 kilograms (kg) and also between ranges of 1600 – 3,000 kg to the factory within a period of one year. A third of the tea farmers delivered between 100 – 1,500 kg of tea leaf and the other third delivered between 1,600 – 3,000 kg of tea leaf to the factories last year. Less than a quarter of the farmers delivered between 4,600 – 6,000 kg and

3,100 – 4,500 kg of each category. Only paltry 1.5% respondents delivered between 7,600 – 10,500 kg of tea leaf to the factory. By being able to deliver all their tea, farmers were motivated to increase on their tea production.

Most of the tea farmers were satisfied with tea collection, with a good number, 33.4% being dissatisfied with collection services. 12.7% of the tea farmers were indifferent with tea collection services while 5.6% are extremely satisfied and only 2.8% are extremely satisfied. The implication of level of satisfaction of collection of tea leaf is critical in production, because it implies that the 28.2% and 5.6% respondent, who are either dissatisfied or extremely dissatisfied, would not be motivated to produce tea. The slow pace of leaf collection can be attributed to monopolistic nature of these markets, because farmers are required by contractual obligation to deliver tea leaf to the contracting factory (Tea Act, 2000).

The Food and Agricultural Organization Intergovernmental meeting on tea, 2005, concurs with the following findings. Less than half of the tea farmers are satisfied with tea market and more than half are not satisfied. This again has to do with market structure, where KTDA managed factories have monopolistic tendency, hence dictating prices (KIPPRA, 2000). If the government through TBK could register more players, these could change the market structure to the benefit of the tea farmers as it will enhance competition. 43.7 % of the respondent were satisfied with tea market, while 28.2% are dissatisfied with the same. The findings show that 16.9% respondents were indifferent, while 7.0% of the farmers were extremely dissatisfied and only 4.2% are extremely satisfied. In a free market economy such as in Kenya situation, prices are determined by interaction forces of supply and demand; hence factories can do nothing to control this variable.

Tea farmers, because of the homogeneity of their tea products can only strive to reduce their variable costs of production in order to realise maximum returns hence increasing their levels of satisfaction. The cyclical nature of agricultural markets as expounded by the cobweb theorem concurs with this assertion. Quite a good number of tea farmers were not aware that the tea market was flooded, with 56.5% of the respondents being aware of the glut. The implication is that the 43.5 % of the tea farmers who are not aware of glut will continue to enhance tea production with the hope that the market will absorb all their tea but this in the long run will lead to oversupply and depressed price hence declining returns. Kaldor, (1934) agrees with this finding in the assertion that agricultural markets are a context where the cob web model might apply.

#### **5.3.4 Poverty Profile**

Wolterstrff (1983) proposes that people need an environment that supports life, and if money, land and livestock are largely absent poverty is the result. This proposition adequately supports the findings of this study. Our study found that a good number of farmers lack alternative sources of income and fear to shift to other crop enterprises.

A fifth of the tea farmers relied solely on tea production and income, while majority had another source of income besides tea. The alternative sources of income ranged from coffee, dairy cows, horticulture, poultry and business. This meant that income from tea alone was not adequate for the farmers and many were cultivating tea to supplement other inadequate sources of income. Majority of the tea farmers had adopted the strategy of diversification to cushion themselves against risk and uncertainty associated with farming hence expanding their income base.

The result also indicate majority of the tea farmer are enslaved in tea cultivation because of various reasons that ranges from lack of alternative income generating crop, fear to change to unknown and because of cultural aspect, that is, everybody is growing tea. Wolterstorff,(1983), agrees with this on the assertion that the physical causes of poverty are intensified by the social causes of poverty.

Therefore, if the tea farmers can be encouraged to diversify into other profitable enterprises their income would rise and oversupply of tea into the market would be checked. The overall effect being reduced poverty levels. Half of the farmers produced tea simply because there lacked a better alternative or they feared to shift to unknown. Slightly more than a third was comfortable with producing tea as a source of income. Some of those interviewed continued to cultivate tea because they lacked a better alternative enterprise. Of the 72 tea farmers interviewed, 19.7% continue to cultivate tea because they fear to change to other enterprise while only 1.5% of the respondents cultivate tea because everybody is growing tea. If majority of the farmers were given incentive such as alternative income generating crop and sensitized on other profitable enterprise could leave tea production thus curtailing oversupply of tea and improving tea prices in the world market.

#### **5.4 Conclusion**

Based on the above analysis and findings it was clear that the high literacy levels among the farmers together with the several on farm trainings given by the Extension Officers impact positively on increased tea production. The farmers' consciousness to develop is portrayed by yearning for more education to assist in increased tea production.



The high levels of both fertilizer and labour usage in the County, holding other things constant, was of increased tea production by the small holder tea farmer. Farmers are able to dispose all their tea into the factories; hence this becomes an incentive to increase tea production. Unaware of the glut in the market, the farmers continue expanding tea production, and the more they do it, the more they become unsatisfied with the market. Forces of demand and supply set in to check tea prices. Majority of tea farmers have diversified into other crops, while new tea farmers enter into tea production for either lack of alternative or want to diversify. Only very few farmers were comfortable with farming tea alone. Half of the famers, given an alternative can shift from tea farming.

In summary, the findings of this study indicate that increased tea production in Kirinyaga County over the years is as a result of accelerated growers' education, easy access to farm inputs, ready tea market and pressure of poverty within the farmers.

### **5.5 Recommendations**

This study makes the following recommendations for the benefit of the small holder tea farmer in Kirinyaga County:

Both the custodians of the tea regulations, Kenya Government and Tea Board of Kenya, should put in place a practical infrastructure that ensures social-economic equity environment for the small holder tea farmer. Tea Research Foundation of Kenya and KTDA to formulate strategies and technologies that are both economical and sustainable in the small holder tea subsector. The Government and KTDA to put up a clear and strong tea extension policy that can cater for a diversified tea farmer to become social-economically sound.

In order to educate and empower the farmer, the Government and KTDA to lay down a sound structure that transforms the small holder tea farmer positively. The concept of “extension” should be reconsidered and replaced with dialogue and communication.

### **5.6 Suggestions for further Research**

From the findings, this project report suggests further research in the following areas:

1. To investigate the socio-economic factors influencing tea production of small holder tea farmers in other Counties of Kenya.
2. To inquire into value addition of Kenyan tea along the marketing chain in an attempt to raise tea income and counter act the rising cost of production.
3. To investigate the tea market and tea marketing diversification in an attempt to raise tea earnings.
4. To investigate the cultural aspect of tea production in relation to poverty levels and assist farmers to treat tea farming as a business.

### **5.7 Summary**

The analysed findings of this study were discussed, conclusions drawn, recommendations made and areas of further research suggested.

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## APPENDICES

### Appendix 1: Questionnaire for tea farmers

All information given in this questionnaire will be treated with confidentiality. We request for your honest responses.

#### Section A: Background information.

1. Factory name.....
2. Respondent's name (optional).....

#### Section B: Farmer's education level

3. Have you had a formal education? (a) Primary (b) Secondary (c) Tertiary (d) None
4. Do agricultural extension officers train you on tea production? Yes ( ) No ( )
5. If yes, how many times were you trained last year? (a) 1 (b) 2 (c) 3 (d) more than 3 (e) None.
6. Have you ever been trained on tea production by the factory? Yes ( ) No ( )
7. How many times were you trained last year? 0.....1.....2.....3.....4 more than 4..... (Tick one.)
8. How would you rate the number of annual trainings given to you? (1) Not enough (2) Enough (3) More than enough (4) Excessively many.
9. Are you aware that tea market is already flooded? Yes ( ) No ( )

#### Section C: Farm inputs used.

1. Do you apply fertilizer in your tea?: Yes ( ) No ( )
2. If yes, how many bags do you apply per year? .....
3. Is this amount of fertilizer enough for your tea farm? (a) Yes (b) No
4. Are you able to pay for this fertilizer? (a) Yes (b) No
5. Do you normally receive your tea fertilizer when you require it? (a) Yes (b) No
6. How many people, per month, do you normally engage to pluck your tea? .....
7. Is this labour enough for your farm? (a) Yes (b) No



- 8. Are you able to pay for your farm labour? (a) Yes (b) No
- 9. Do you get this labour when you require it? (a) Yes (b) No

**Section D: Market for tea.**

- 10. Did you deliver all your tea to the factory during the last twelve months? Yes ( )  
No ( )
- 11. If no, what made you not to deliver? ( ) Factory did not collect. (b) I failed to deliver.  
(c) Any other. Specify.....  
.....
- 12. How many kilograms of tea did you deliver to the factory last year? .....
- 13. How satisfied are you with (Tick one)

[a] Green leaf collection by the factory? 1 2 3 4 5

[b] Tea market? 1 2 3 4 5

**Key:** 1= extremely dissatisfied. 2= Dissatisfied. 3= Neutral. 4= Satisfied.  
5= extremely satisfied.

**Section E: Poverty**

- 14. What other alternative source of income apart from tea do you have?
  - a. ....
  - b. None.....( Tick)
- 15. Why do you continue growing tea? ( Tick as appropriate)
  - a. Lack of better alternative income generating crop.....
  - b. Fear to change to unknown.....
  - c. Every body is growing tea.....
  - d. Others (specify).....