

**PRODUCER INSTITUTIONAL ARRANGEMENTS IN  
KENYA'S COFFEE SECTOR AND THEIR EFFECT ON  
ECONOMIC BENEFITS TO FARMERS**

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**Producer Institutional Arrangements in Kenya's Coffee Sector and  
their Effect on Economic Benefits to Farmers**

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**A Thesis Submitted in Partial Fulfillment for the Award of the Degree  
of Doctor of Philosophy in Development Studies in the Jomo Kenyatta  
University of Agriculture and Technology**

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as university supervisors.

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## **DEDICATION**

To the treasured memory of my father, Charles Karuri Mbutu and the continual love and support of my mother, Mary Wanjiku Karuri.

## **ACKNOWLEDGMENT**

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

<b>AFFA</b>	Agricultural, Fisheries and Food Authority
<b>CA</b>	Capability Approach
<b>CBK</b>	Coffee Board of Kenya
<b>CCC</b>	Coffee Commodity Chain
<b>CIDIN</b>	Centre for International Development Issues Nijmegen
<b>FCE</b>	Farmer Controlled Enterprises
<b>GAP</b>	Good Agricultural Practices
<b>ICA</b>	International Coffee Agreement
<b>ICO</b>	International Coffee Organization
<b>NIE</b>	New Institutional Economics
<b>TCE</b>	Transaction Cost Economics
<b>WB</b>	World Bank

## DEFINITION OF TERMS

**Agency** an actor's ability to consider and purposively choose options (Alsop, Dudwick, Bertelsen & Jones, 2007).

**Coffee certification** a system that distinguishes a coffee product as being sustainably

grown on the basis of economic viability, environmental conservation, social responsibility and ensures traceability (AFFA, 2015).

**Coffee estate** any large area of land or group of parcels of land under the same ownership on which coffee is grown and shall be not less than two hectares (AFFA, 2013).

**Coffee milling** the processing of parchment or *mbuni* to clean coffee (AFFA, 2013).

**Contract farming** agricultural production carried out according to a prior agreement in which the farmer commits to producing a given product in a given manner and the buyer commits to purchasing it (Minot 2011).

**Direct sale** contractual agreement between the grower marketer and buyer located outside Kenya for the sale of clean coffee based on mutually accepted terms and conditions enforceable in law and registered by the Authority (AFFA, 2013).

**Economic benefits** a benefit that can be expressed numerically as an amount of money

that will be saved or generated as the result of an action (Businessdictionary.com, 2016).

**Empowerment** a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes (Alsop, Bertelsen & Holland (2006).

Institutional

**Arrangement:** the policies, systems, and processes that organizations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfill their mandate (UNDP, 2015).

**Institutional**

**Framework** the systems of formal laws, regulations, and procedures, and informal conventions, customs and norms that broaden, mould and restrain socio-economic activity and behavior (Donnellan, Hanrahan and Hennessy, 2012).

**Smallholder** a farmer cultivating coffee in a small parcel or in small parcels of land who does not possess his own pulping station and shall register with a co-operative society (AFFA, 2013).

**Specialty coffee** mild Arabica coffee grown in Kenya and possesses unique characteristics as defined by the buyer (AFFA, 2013).

## **ABSTRACT**

Coffee is the world's most traded tropical commodity and its production is dominated by small-scale farmers globally. A major determinant of the economic benefits derived by coffee farmers is the efficacy of the organizations they form to facilitate the production and marketing of coffee. These Producer Institutional Arrangements in the coffee sector in Kenya are dominated by cooperatives with almost all its coffee farmers belonging to cooperatives. This is due to a legal requirement that mandates farmers with less than five acres to cooperative membership. Numerous studies have therefore focused on coffee cooperatives while alternative forms of production arrangements have remained largely unexamined, including the more than 3000 small Coffee Estates. With numerous reports indicating that Kenya's coffee sector is operating sub-optimally, Producer Institutional Arrangements provide a critical area that warrants empirical analysis. The general objective of this study was an analysis of the relationship between Producer Institutional Arrangements in the coffee sector in Kenya and their effect on Economic Benefits to farmers. The three arrangements that were studied were coffee cooperatives that had received certification, coffee cooperatives that had not received certification and Coffee Estates. The first specific objective was to characterize the three Producer Institutional Arrangements. The second specific objective was to examine the relationship between the institutional framework of the producer arrangement and economic benefits. Asset-based farmer agency was examined as a moderating variable in the relationship between the institutional framework and economic benefits. Three theories were utilized in this study: New Institutional Economics theory, Transaction Cost Economic theory and the Capability Approach. The sampling frame consisted of the coffee farmers in Nyeri County engaged in production in the period of 2012/13-2014/2015. Questionnaires and key informant interviews were used to collect data and information. There were 260 respondents out of the targeted sample of 384, which represented a response rate of 68 per cent. The study established that there were significant relationships between the producer institutional frameworks and economic benefits to farmers in all the producer arrangements. It was also determined that farmer agency, influenced the relationship between the institutional framework and economic benefits the most in the Certified Coffee Cooperatives, followed by Coffee Estates and lastly in the Non-certified Coffee Cooperatives. It was therefore concluded that farmer agency was most effective in Certified Coffee Cooperatives. While there were benefits to certification, challenges to acquiring and maintaining certification also existed. The findings of this study are consistent with the theories used and demonstrate that institutions are a key factor in development as asserted by the New Institution Economic theory. It is also demonstrated that transaction costs are a significant aspect of the economic benefits that accrue to farmers. The Capability Approach is instrumental in interpreting the moderating influence of asset-based agency and how this differs between the Producer Institutional Arrangements. The study advances research methodology particularly in the use of comparing institutional arrangements. Recommendations included the facilitation of

certification in the non-certified cooperatives and estates, and the implementation of transparency and accountability measures in the coffee chain activities and transactions.

## **CHAPTER ONE**

### **INTRODUCTION**

This chapter provides information that gives a context of the research and enables an analysis of the relationship between Producer Institutional Arrangements and their effect on economic benefits to farmers. It includes a background of the study, the global perspective of the coffee sector, the coffee sector in Kenya, a description of coffee farmers, the statement of the problem, objectives of the study, hypotheses of the study, significance of the study, the scope of the study and limitations of the study.

#### **1.1 Background of the study**

Coffee is referred to as ‘black gold’ due to its high global demand and value. It has played a major role in global and national politics and socio-economic development. It is widely believed to have originated in Ethiopia between the 9<sup>th</sup> and the 13<sup>th</sup> century and had by 1500 become a commercial commodity. Currently, it is the world’s most traded tropical commodity and among the top five in global trade (Ponte, 2002; Topik, 2009). Trade in coffee involves numerous actors and processes from production to consumption and attempts to control its trade have taken place since the beginning of the 20<sup>th</sup> century (Topik, 2009). Its production is predominantly by small scale farmers who, it is acknowledged widely in the literature, often struggle to benefit from coffee production. Small-scale farmers therefore commonly unite in the activities and processes of coffee production and marketing in a bid to increase their economic benefits. The relationship between the institutional framework of these arrangements and economic benefits to farmers was the focus of this study.

##### **1.1.1 Global Perspective of Coffee Sector**

Globally, trade in coffee is overseen by the International Coffee Organization (ICO), an intergovernmental organization created under the auspices of the United Nations

to serve the international coffee community (ICO, 2015). Global coffee production in 2013/2014 was estimated at 146.8 million 60 kg bags, with Africa producing 16.2 million bags. This represents about 11 per cent of global coffee production, although African countries constitute 19 out of 40 exporting countries, representing almost half of all coffee exporting countries (*ibid*, 2015). Due to reliance on coffee for export earnings, producing-country governments have historically regarded coffee as a ‘strategic’ commodity and either directly controlled domestic marketing and quality control operations or strictly regulated them (Ponte, 2002).

In the 1990s however, the United Nations (UN) joined the World Bank (WB) and the International Monetary Fund (IMF) to promote a policy of liberalization (UNGA, 1998). In the agricultural sector, liberalization involved legal and policy reforms with a principal aim of empowering farmers. It sought to provide better economic returns to farmers by allowing competition in the processing and marketing of commodities. The dismantling of coffee production quotas as a liberalization measure however resulted in negative economic repercussions in producing countries (World Bank, 2005). While producing governments implemented liberalization measures in the coffee sector to varying degrees and in different aspects, liberalization is widely regarded as having disempowered small-scale farmers.

Currently, nineteen of the ICO members are least-developed countries. It is also noted that in almost all African countries, coffee farming is dominated by smallholdings varying in size from half a hectare to 10 hectares per farm. The exceptions are Malawi and Zambia as their coffee farming is dominated by estate holdings (ICO, 2015). According to UNCTAD (2018), based on 2016 statistics, Africa had 2 million hectares under coffee cultivation with a production of 1 million tons, resulting in export value of \$1.9 billion. Based on 2016 ICO statistics, UNCTAD (2018) calculated the share of Africa coffee exports to be 11 per cent of global exports, with 9 per cent being from East Africa. Majority of small scale farmers globally produce independently as opposed to being part of an organization. According to Zamora (2013) coffee share by size and type is estimated at 20 percent for large farms (large estates), 25 per cent for small farms in organizations and 55 per cent for independent small farms (small estates). The Preamble of the 2007

agreement of the ICO, which entered into force definitively in 2011, recognizes the role of a sustainable coffee sector in poverty eradication and one of its objectives is to encourage members to develop strategies to help local communities and small-scale farmers benefit from coffee production. It however has no economic clause to limit production (ICO, 2014). Kenya ratified the 2007 ICO agreement on 22 May 2008 (ICO, 2015). The Producer Institutional Arrangements within which farmers engage with facilitates or inhibits their capacity to engage beneficially with other actors and processes in the coffee chain. These differing empowerment levels are key to policy formulation and development interventions.

### **1.1.2 The Coffee Sector in Kenya**

The coffee industry in Kenya supports over 700,000 households, contributes approximately one per cent to the GDP, eight per cent of the total agricultural export earnings and up to 30 per cent of the total labor force employed in agriculture, with a total of 109,795 hectares of arable land under coffee production (Agriculture, Fisheries and Food Authority (AFFA), 2015). The estimated 700,000 small scale farmers produce 55-60 per cent of Kenya's coffee, with the remaining 40-45 per cent being produced by estates (KCCE, 2017). This is done through 432 coffee cooperative societies and 4,000 estates (AFFA, 2015). Total exports for October 2013 to August 2014 were 716,030 60kg bags (ICO, 2014). Coffee exports (unroasted) for 2014 were sh.19,913 billion and it is the fourth leading export item after horticulture, tea and articles of apparel and clothing accessories (Kenya National Bureau of Statistics (KNBS), 2015).

The importance of the coffee sector in Kenya is highlighted by its link to key economic indicators such as the GDP, the poverty index, rural development, employment rates in coffee-growing areas, inequality levels, ability to cater for basic educational and medical needs and food security (K'Okoth, 2013). An approximate 3.5 million people benefit directly from coffee (KCCE, 2017). The coffee sector in Kenya pre-liberalization was highly regulated with small scale farmers mandated to cooperative membership, to processing coffee under one state-owned miller and

marketing by the then state owned Coffee Board of Kenya. Thuku, Gachanja and Obere (2013) explain that the liberalization of Kenya's market policies began in 1986 and required a reduction of government involvement in the non-strategic sectors of the economy and the promotion of the private sector.

Liberalization of Kenya's coffee sector involved a gradual implementation of various laws and regulations. They included withdrawing from cooperative management and ending financial support to cooperatives, including the Kenya Planters Cooperative Union which was the sole coffee miller, and the Coffee Research Foundation (CRF) in 1991, reducing acreage of cooperative farmers from 10 acres to 5 acres in 1996, relaxing regulation of upstream processes in 1999, allowing growers to choose among pulping factories, millers, and marketing agents in 1999, limiting the role of the CBK as regulator in 2001, privatizing the coffee auction and allowing direct sales in 2006 (Condliffe *et al*, 2008).

Cooperatives at the factory level can therefore choose to either mill their own coffee (private milling) or use a commercial miller. Cooperatives and estates then either use a marketing agent or directly market their coffee. Marketing agents regulate the sale programme and decide on the quantities and qualities to offer at every auction (USAID, 2010). Their responsibilities include availing samples for the dealers prior to the auction, representing growers during the auction, collecting and distributing proceeds from exporters following final sales (Kennedy, 2005; Monroy, Mulinge & Witwer, 2013). Coffee taken to the central auction at the Nairobi Coffee Exchange is sold through dealers and exported either as straight lots, or blended into larger quantities of homogenous quality with a small percentage roasted locally (USAID, 2010). Additionally, cooperatives and estates have the option of using coffee management agents. In the 2013-2014 year, the CBK licensed twelve millers, six marketing agents, fifteen grower-marketers - of which four were cooperative societies, three were cooperative unions and the rest large estates, sixty eight dealers, six management agents and twenty-one warehousemen.

Liberalization therefore led to a proliferation of actors in the coffee chain and a multiplicity of choices. The change in laws and regulations governing the coffee sector therefore resulted in a change in the institutional framework of the Producer

Institutional Arrangements that farmers engage in. While the institutional framework within which coffee farmers engage in changed, the law still mandates small-scale coffee farmers to cooperative membership. Small-scale farmers are the bulk of coffee producers and the study of institutions is therefore key to the economic performance of the coffee sector. Institutional arrangements have the goal of facilitating production and enabling farmers' reach their main goal of production which is garnering economic benefit from their activities. The goal of economic benefit is shared by farmers, whether in cooperatives or in estates. This study fills the gaps in literature related to coffee by conducting a comparative study of alternative Producer Institutional Arrangements in the coffee sector and on analyzing the role of farmer agency within the context of the institutional arrangements.

### **1.1.3 Coffee Farmers**

Coffee farmers are the target population for this study which will focus on the institutional arrangements within which farmers engage in production. There are 25 million small scale coffee farmers and their families who produce 70 per cent of the world's coffee. It is noted that many of them struggle to survive at subsistence levels, with the average Arabica coffee farmer earning less than \$2 per day from handpicked coffee on less than a hectare of land. This is despite relatively high prices for green coffee in the international market (ICO, 2015). Among the reasons given for this is a lack of knowledge and capacity to contend with the market, including lack of instruments for managing price volatility, financial constraints, inadequate access to inputs, insufficient technical support to combat pests and diseases and increase productivity (ICO, 2015).

The institutional framework within which farmers operate determines their capacity to make choices and benefit from these choices. There is no universal definition of the term small scale farmers as 'small' is a relative term. In Fischer and Victor (2014) for example, small holdings were considered as being those below 2.2 ha. In Kenya, small scale farmers are regarded as having less than two hectares (approximately five acres) and are mandated to produce as part of a cooperative,

while those with more than two hectares can apply for a license to produce as estate growers independent of a co-operative (AFFA, 2013).

## **1.2 Statement of the Problem**

Coffee production in Kenya is dominated by small-scale farmers who are mandated to cooperative membership and producer arrangements are therefore an integral part of the coffee sector in Kenya. Coffee farmers with more than five acres however have the option of obtaining a coffee estate license that enables them produce and market coffee independent of a co-operative (AFFA, 2013). Although cooperatives remain the dominant producer arrangement in the coffee sector since independence, changes in the laws and the regulations that govern the coffee sector have changed since then due to liberalization and more recently due to the devolution of government in 2010. The institutional framework of producer arrangements in the coffee sector has therefore changed as counties take over the devolved functions of government which include agriculture. Despite these changes, numerous challenges persist in the coffee sector in Kenya (NCCT, 2013).

Two inter-related problems therefore guided this study. The first was that studies on the coffee sector in Kenya focus majorly on cooperatives as they are the dominant Producer Institutional Arrangement. The unifocus on cooperatives is problematic as it results in a paucity of knowledge and subsequent deliberation on the functioning of small estates. Nyeri County for example renewed 169 coffee estate licenses for the 2015/16 year, 98 of which were for estates with 5 hectares and less. The second problem is that most studies fail to differentiate between cooperatives, including between certified and Non-certified Coffee Cooperatives and treat them as homogenous. The limited knowledge on comparison between the Producer Institutional Arrangements in the coffee sector - Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates, leaves a number of pertinent questions unanswered: Do small scale farmers have similar economic benefits across Producer Institutional Arrangements? Does a farmer's individual agency affect the

economic benefits derived? Is there empirical evidence to justify the continued legal mandate for universal cooperative membership of smallholder farmers in Kenya?

This study sought to fill these knowledge gaps by comparing the three Producer Institutional Arrangements in Kenya. Cognizance was taken of the fact that farmers are not homogenous in their capabilities. Farmer agency, which uses several assets as indicators, was therefore taken as a moderating variable in the relationship between institutional frameworks and economic benefits. The study of Producer Institutional Arrangements and their effect on economic benefits is therefore important as it provides an empirical basis for policy and legislation that pertains to institutional arrangements.

### **1.3 Objectives**

#### **1.3.1 General Objective**

This study sought to analyze the relationship between Producer Institutional Arrangements in the coffee sector and their effect on economic benefits to farmers.

#### **1.3.2 Specific Objectives**

The study was guided by the following specific objectives:

- i. To characterize Producer Institutional Arrangements in the coffee sector in Kenya.
- ii. To determine the effect of the institutional framework of the producer arrangement on economic benefits to farmers.
- iii. To establish the extent to which farmer agency moderates the relationship between the institutional framework and economic benefits to farmers.

### **1.4 Hypotheses**

H<sub>02</sub>. There is no significant relationship between the institutional framework and economic benefits to farmers.

H<sub>03</sub>. Farmer agency does not moderate the relationship between the institutional framework and economic benefits to farmers.

### **1.5 Significance of the Study**

The coffee sector in Kenya supports an estimated 700,000 coffee farmers and 6 million people employed directly or indirectly. The performance of the coffee sector is therefore crucial to their welfare. With coffee being the top globally traded tropical commodity, the substantial level of its proceeds is irrefutable. Coffee farmers in Kenya however receive a disproportionately small amount of these proceeds. The findings of this study will enhance an understanding of the relationship between institutional arrangements and economic benefits to farmers. This will in turn guide evidence-based policy formulation.

In terms of national economic growth, coffee plays a crucial role in Kenya's development. It is the fifth foreign exchange earner with immense potential for greater production and better quality. Coffee was once the top foreign exchange earner which substantiates the contention that the sector is underperforming. The significant reduction in acreage under coffee signals a diversion towards other sectors regarded as more viable. Devolved government in Kenya currently places the onus of agricultural production on county governments. It is therefore imperative that evidence-based policy and practice govern decision-making in the sector. This study is important and timely as counties take over the management of this strategic sector. The findings of this study will therefore have practical implications for development interventions.

The empirical findings of this study add to the existing body of knowledge and form the basis for further research and theory development. An analysis of coffee production institutional arrangements draws on and has implications for several academic disciplines including agriculture, economics, political science and sociology. This is especially significant to the field of Development Studies, whose inter-disciplinary and multi-disciplinary foundation seeks a holistic view of development challenges and their possible solutions.

## **1.6 Scope**

This study focused on coffee farmers in Nyeri County who were actively engaged in coffee production in the 2012-2015 period. It included members of coffee cooperatives situated in Nyeri County and coffee estate owners licensed during this period in Nyeri County.

## **1.7 Limitation of the Study**

Out of the fifty-six estate respondents, only one indicated their coffee was certified. A comparative analysis could therefore not be made between certified and non-certified Coffee Estates. However, a comparative analysis was performed between the Certified Coffee Cooperatives, the non-certified cooperatives and the Coffee Estates.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter comprises a theoretical review, a critique of the literature and research gaps. It reviews the literature related to the Producer Institutional Arrangements in the coffee sector, which are Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates. It also reviews the literature that depicts the relationship between Producer Institutional Arrangements and their effect on economic benefits of farmers, as well as the role of farmer agency in this relationship. The conceptual framework illustrates the relationship between the variables under study, with the institutional framework of producer arrangements as the independent variable, economic benefits to farmers as the dependent variable and farmer agency as the moderating variable. The theories that anchor this study are discussed as well as a critique of other studies that utilize these theories. The chapter concludes with a summary and an identification of the research gaps.

#### **2.2 Theoretical Review**

A theory is a systematic explanation for observations that relate to a particular aspect of life (Babbie, 2010). This study used three theories in conceptualizing the problem under study and in the explanation of the findings. These were the New Institutional Economics (NIE) theory, the Transaction Cost Economic (TCE) theory and the Capability Approach (CA).

##### **2.2.1 New Institutional Economics (NIE) Theory**

New Institutional Economics originated from the independent work of Ronald Coase, Mancur Olson, Douglass North and Oliver Williamson (Schneider & Doner, 2000). The term 'new institutional economics' however originated from Williamson in 1975 (Klein, 1999; Kerallah & Kirsten, 2002). Kherallah and Kirsten (2002) note

that the phrase ‘new institutional economics’ was used by Williamson to distinguish it from the ‘old institutional economics’ that argued that institutions were a key factor in explaining and influencing economic behaviour but did so outside the framework of neoclassical economics. The NIE however argues that institutions can be analyzed within the framework of neoclassical economics. Klein (1999) states that the goal of NIE is to explain what institutions are, how they arise, what purposes they serve, how they change and how they should be reformed if need be. He also highlights the role of institutions in economic development, stating that economic growth depends on the degree to which potential hazards of trade can be controlled by institutions. Menard and Shirley (2012) explain there is no general theory of institutional economics. They state that the field of NIE was divided from its beginning into several decentralized and distinct schools of thought.

One prominent school which identifies with Coase and Williamson focuses on property rights and contracts at the firm level while another which identifies with North analyzes broader institutional environments and the role of the state. According to North (n.d), the NIE is an attempt to incorporate a theory of institutions into economics. He however explains that NIE’s intention is not to replace neo-classical theory but to build on, modify, and extend it to enable it to engage with issues that were previously beyond its scope. He argued that institutional change occurs when those with bargaining strength to change institutions perceive that it is to their benefit to do so (North, 1990). Menard and Shirley (2012) note that institutions are instrumental in explaining the persistence of underdevelopment as well as the failure of reforms based on imported rules, laws, and constitutions.

Kherallah and Kirsten (2001) note the relationship between institutions and economic growth and explain that institutions have a profound influence on economic growth, and conversely, economic growth and development often result in a change in institutions. They however caution that not all institutional changes are beneficial. By influencing transaction costs and co-ordination possibilities, institutions and institutional arrangements can have a facilitating or constraining effect on economic growth. They state that NIE can be applied to an analysis of changes in the food and agricultural sector in developing countries post-liberalization

as well as to an analysis of government devolution. This was particularly useful in this study as devolved government in Kenya took effect in 2010, leading to the county governments' taking over significant aspects of agricultural production and marketing.

Kherallah and Kirsten (2002) note that according to Williamson (2000), the NIE operates at the macro and micro level. The macro level is the one that deals with the institutional environment while the micro level deals with the institutions of governance, known as the institutional arrangements. These include cooperatives and farmer organizations. The NIE was used in this study to examine Producer Institutional Arrangements in the coffee sector in Kenya and enabled an analysis of the relationship between the institutional framework and economic benefits to farmers.

### **2.2.2 Transaction Cost Economic (TCE) Theory**

The Transaction Cost Economic theory emanates from the NIE theory. Kherallah and Kirsten, (2002) note that NIE considers that the cost of transacting which is determined by institutions and institutional arrangements is the key to economic performance. They also note that the general hypothesis of the TCE strand of the NIE is that institutions are transaction cost-minimizing arrangements that may change and evolve with changes in the nature and sources of transaction costs. The concept of transaction costs was propounded by Coase in 1937, where he argued that the reason that all exchanges do not take place in the market by means of short-term contracts among individuals is because there are costs to transacting in the market place. Firms can therefore reduce these transactions costs by eliminating the need for bargaining among the many factors of production and replace this with coordination by a hierarchy (Menard & Shirley, 2012).

Coase argued that market exchange is not costless as it included costs of information, negotiation, monitoring, coordination and contract enforcement (Kherallah & Kirsten, 2002; Klein, 1999). Schneider and Doner (2000) state that NIE lays emphasis on the potential costliness of transactions and note that Williamson focuses on specifying

the costs of transactions, the factors that increase these costs and the institutional responses to such costs. They also note that transactions involve costs because they typically require agents to search for partners, bargain with them and enforce and monitor any agreement. It is these costs, they explain, that generate market imperfections, lead to market failure and generate demand for institutions to redress them.

Coase (1992) notes the need to specify the institutional setting within which the trading takes place, since this affects the incentives to produce and the costs of transacting. Williamson (1979) analyzed situations whereby the cost of integration discourages integration but firms choose not to revert to spot transactions but instead chose another form of governance. Klein (1999) explains that TCE represents another approach to studying institutional arrangements with the emphasis being on governing transactions. He further explains that governance structures can be described along a spectrum with the pure anonymous spot market on one end and the fully integrated firm on the other. Between the two poles of market and hierarchy are a variety of 'hybrid' modes such as complex contracts and partial ownership arrangements. He therefore states that all feasible modes of economic organization incur costs and the nature of the firm is therefore determined by the relative costs of organizing transactions under alternative institutional arrangements.

In this study, transaction costs will be examined in terms of the economic benefits to farmers and this will be done in the context of their institutional framework. This will enable an examination on how transactions costs and thus economic benefits, relate to the institutional framework within which farmers operate. The Transaction-Cost Economic (TCE) theory is instrumental in examining the rationale behind farmer engagement with a particular Producer Institutional Arrangement and economic benefits derived from this engagement.

### **2.2.3 Capability Approach**

The Capability Approach (CA) was pioneered by Amartya Sen and has been developed significantly by scholars across the humanities and social sciences and by

philosophers such as Martha Nussbaum (Robeyns, 2011). The CA focuses on the development of human potential by increasing the options or capabilities available to them, rather than on mere provision of commodities to alleviate poverty (Castro-Rodriguez, 2010). Botbol-Baum notes the relations between the CA and empowerment and explains that Sen's CA offers an understanding of the process of empowerment as the process of expanding individual's set of capabilities.

It is further explained that this process of expanding an individual set of capabilities can be understood as an empowerment process. Alsop and Heinsohn (2005) note that empowerment is defined as a person's capacity to make effective choices, which means the capacity to transform choices into desired actions and outcomes. They further explain that the extent of which a person is empowered is influenced by two sets of factors. The first is personal agency which is the actor's capacity to make purposive (meaningful) choices, that is, to envisage options and make a choice. The second is opportunity structure, which is the institutional context, both formal and informal, in which choice is made.

The CA contends that merely availing options is not sufficient. Those to whom the options are availed require the capability to make purposive choices and to transform these choices to desirable outcomes (Ibrahim & Alkire, 2007). Alkire (2005) explains that for the purposes of the CA, agency primarily refers to a person's role as a member of society, with the ability to participate in economic, social and political actions. Alsop and Heinsohn (2005) explain that in measuring agency, asset endowments are used as indicators of agency and can be psychological, informational, organizational, social, financial or human. The opportunity structure is measured by the presence of an operation of formal and informal institutions, including the laws, regulatory frameworks, and norms governing behaviour. They further explain that agency and opportunity structure are hypothesized to associate with the degrees of empowerment a person or group experiences. Degrees of empowerment can be measured by a three-step assessment: whether a person has the opportunity to make a choice (existence of choice), whether a person actually uses the opportunity to choose (use of choice) and whether the choice made resulted in the desired outcome (achievement of choice).

Several studies highlight the complexity of the relationship between institutional framework and agency. Fischer and Victor (2014) use the capabilities framework to discuss the aspiration and agency of small-scale coffee farmers in Guatemala. Their study is based on the argument that while the CA to development posits that human development should be measured by the ability of individuals to envision and pursue goals that they value, as well as by real opportunities to achieve those goals, what people value does not emanate from purely endogenous sources. They cite sources such as Li 2007; Williams 1987; Jaggar 2006; Escobar 1994; Conroy, Murray and Rosset 1996 who state that desires are shaped by power relations, social norms, and institutional structures. Based on this rationale they examine how the culturally and morally inflected desires of new smallholding coffee producers in Guatemala operate within the opportunity structures of the national and international coffee market.

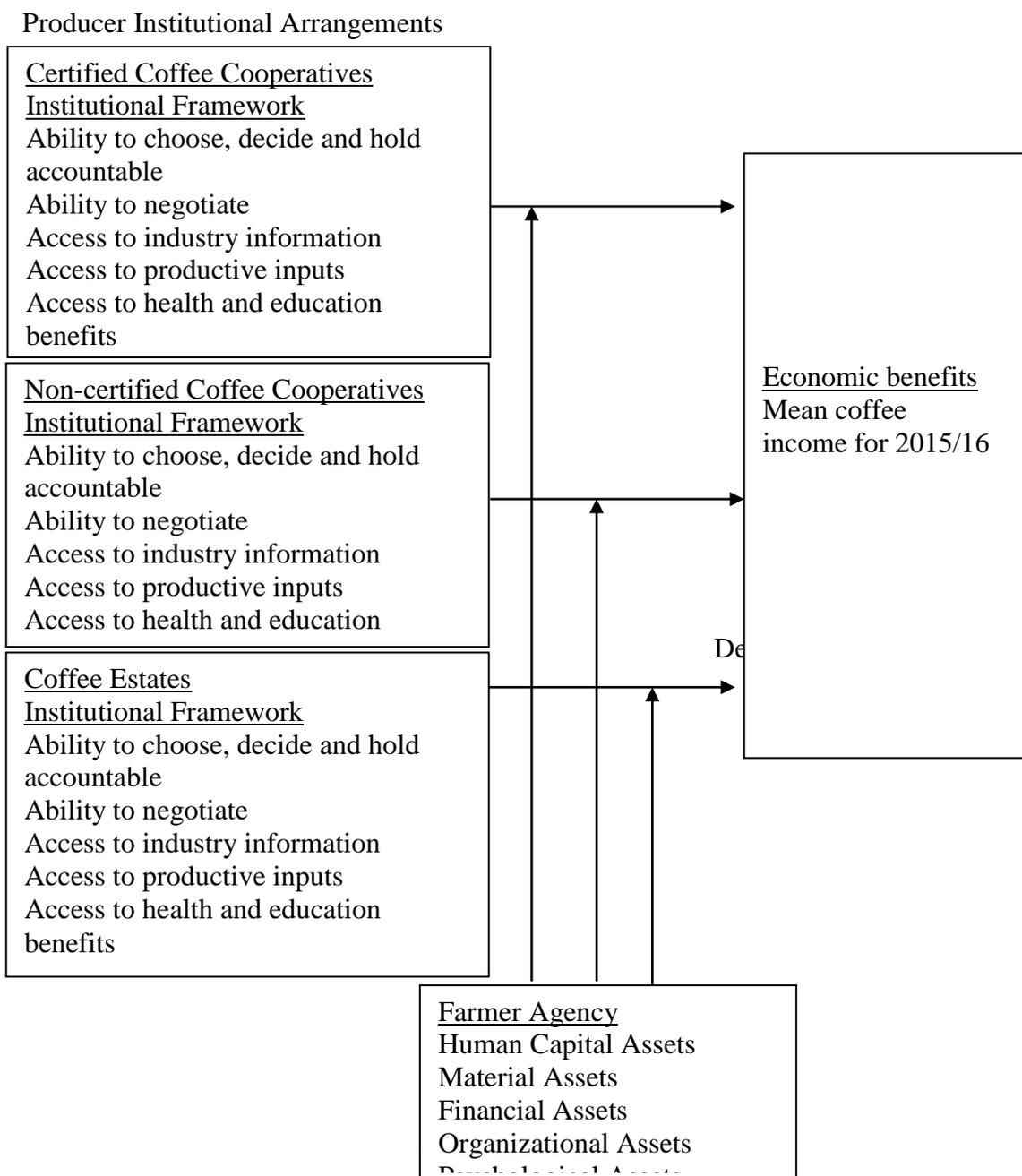
In a study by Jorgensen and Muller (2003), the CA is taken as the theoretical and normative foundation of their study of two coffee cooperatives in Mexico whereby collective capabilities are viewed as being social entities that are not only productivity-enhancing but equally capability-expanding. They therefore regard poverty as not merely income poverty but as capability deprivation and view the cooperative movement in Mexico as a collective capability that expands the capabilities of the individual member or household, in a way that would have been difficult for members to achieve individually. Liberalization indisputably availed more options to coffee farmers. There is however the probability that farmers do not have the capability to utilize the available choices. The World Bank (WB) definition of empowerment is the increase of assets and capabilities to allow individuals or groups to make purposive choices and transform these choices to desirable outcomes.

Capabilities are therefore an integral aspect of empowerment, which in turn is an essential component of development. Robeyns (2005) however emphasizes that the CA is not a theory that can explain poverty, inequality and well-being. Rather, it provides a tool and a framework within which to conceptualize and evaluate these phenomena. He therefore states that applying the CA to issues of policy and social change will require the addition of explanation theories. This study used the CA to

examine the moderating role of agency in the relationship between the institutional framework of the producer arrangement that farmers engage in and their economic benefits. Indicators for farmer agency were limited to the assets that were deemed instrumental in achieving economic benefits. The Capability Approach (CA) enables an examination of the moderating role of farmer agency in the relationship between producer institutional frameworks and economic benefits to farmers.

#### **2.2.4 Conceptual Framework**

The conceptual framework depicts the relationship between the institutional framework of the producer arrangements and their effect on economic benefits. It also depicts the moderating role of farmer agency in this relationship. According to the tenets of the NIE theory, institutions have a bearing on the economy. The NIE theory therefore enables an analysis of the relationship between the institutional framework and economic benefits. The TCE theory indicates that economic benefits to farmers would be influenced by the costs of the transactions carried out in the production and marketing of coffee. This is done in the context of the institutions that farmers are a part of. The TCE theory therefore further enables an analysis of the relationship between the institutional framework and economic benefits to farmers. The Capability Approach is instrumental in analyzing the moderating role of farmer agency in the relationship between the institutional framework and economic benefits, as agency is concerned with the capacity to make purposive choices.



**Figure 2.1 Conceptual Framework**

Figure 2.1 depicts the relationship between the Producer Institutional Arrangements and Economic Benefits. The Producer Institutional Arrangements are the Certified Coffee Cooperatives, the Non-certified Coffee Cooperatives and Coffee Estates. In each of the producer arrangements, specific indicators of the Institutional Framework

of each arrangement are considered against Economic Benefits. Farmer agency as a moderator in the relationship between each producer arrangement and Economic Benefits is also depicted.

### **2.2.5 Producer Institutional Frameworks**

This study focused on Producer Institutional Arrangements because the way in which coffee farmers organize themselves and the institutional framework they operate within can either facilitate or constrain them. Kenya is unique in its liberalization measures; while it liberalized the milling and marketing aspects of the coffee commodity chain, cooperative membership is still mandated for small scale farmers with less than two hectares (AFFA, 2013). Kenya has the highest percentage of small scale farmers in organized production globally, with all its small-scale coffee farmers belonging to cooperatives. Besides Kenya, among the coffee producing countries, only Tanzania has more than half of its coffee farmers in organized production, having approximately 75 per cent of its farmers in organized production (Zamora, 2013).

That there was no exodus from cooperatives with the 1999 amendment to the coffee cooperative laws raises questions on the desirability and practicability of small scale production outside the cooperative arrangement. Farmers in cooperatives for example are primarily involved in coffee production to the point of delivery of cherry to the factory. All other activities and decisions are from henceforth undertaken by the factory and cooperative management. An estate owner on the other hand will be involved in activities and decisions beyond the primary processing stage. If there are significant differences between Producer Institutional Arrangements, it can be inferred that farmers operating within a certain framework tend to be comparatively more or less empowered.

Numerous studies on the institutional arrangements in the coffee sector center on the effect of liberalization due to its extensive and intensive effect on the entire coffee commodity chain (Bargawi, 2008; Karanja, 2002; Ponte, 2002; Varqa, 2008). Others however focus on the prevailing institutional frameworks and arrangements (Itika,

2002; Kalinda & Chibwe, 2014; Lema & Kapange, 2006; Orozco, 2009). While the objectives and variables used in these studies differ, certain elements pertaining to the level of empowerment of farmers are pervasive. These include the variables that were used in this study to measure empowerment, namely ability to choose, decide and hold accountable, ability to negotiate, access to productive inputs, access to industry information and access social resources. Variables relating to farmer agency were less pervasive but were nonetheless recognized, for example in Lema and Kapange (2006).

The ‘Interim Report’ of the Nyeri County Coffee Taskforce (2013) cites challenges in the sector which include lack of affordable credit, high cost farm inputs, disunity in the co-operative movement, poor corporate governance and political interference and low levels of ICT. It also cites opportunities which include support from the county government, certification schemes, high quality coffee and liberalization of marketing and milling. While there has been extensive research based on cooperatives, the aspects of devolution and the enactment of the AFFA Act 2014, are fairly recent. There is therefore limited research that takes into account the change in the Producer Institutional Arrangements particularly as pertains to their institutional framework.

The limited research also pertains to research that involves other institutional arrangements besides cooperatives. This study has as its first objective, the characterization of institutional arrangements in the coffee sector in Kenya which goes beyond defining and describing, to include an evaluation and analysis of the structure and function of these arrangements. The structure includes both the formal and informal institutional context. This study focuses on the three Producer Institutional Arrangements in Kenya – Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

#### **2.2.6 Producer Institutional Frameworks**

An institutional framework is defined as the systems of formal laws, regulations, and procedures, and informal conventions, customs and norms that broaden, mould and

restrain socio-economic activity and behavior (Donnellan, Hanrahan and Hennessy, 2012). The Coffee Rules encompassed in the Agriculture, Fisheries and Food Authority (AFFA) Act of 2013 comprises the legal framework of the coffee sector. AFFA is the successor of eight former regulatory institutions in the agriculture sector, which now operate as Directorates under the Authority and has devolved agricultural counties functions to the counties in compliance with the 2010 Constitution of Kenya (AFFA, 2015). Liberalization and devolution have both changed the institutional framework of the coffee sector due to changes in the laws and regulations governing the coffee sector.

The importance of institutional arrangements and frameworks in development is widely acknowledged (ICO, 2012; Varqa, 2008; Poulton & Kanyinga, 2013, Karanja, 2002). Alsop and Heinsohn (2005) however caution that measuring institutions is complicated by the huge gap that exists between the presence of rules and the enactment of these rules due to the politicized and socially constructed reality of the enactment of those rules. They therefore suggest a mixed-method approach in the measurement of institutions, including national-level tracking of legislation, regulations, and procedures, as well as an examining of the operation of formal institutions. The opportunity structure encompasses a large domain that includes the wider political, social and economic structure.

This study will focus only on the aspect of the opportunity structure for coffee farmers that relates to the institutional arrangements they are engaged in. The term institutional framework will therefore be used in this study to refer to the opportunity structure of the Producer Institutional Arrangements in the coffee sector. Empowerment in the institutional framework has several dimensions with a range of indicators as depicted in the conceptual framework of this study. The indicators used were derived from the literature review as they were identified as being instrumental to coffee production. In Alsop and Holland (2006), empowerment from institutions is referred to as the opportunity structure and is specified to be institution-based opportunity structure.

In this study, the term institutional framework was used as it more readily conveyed the institutional focus of the study and not the wider context encompassed by the

term ‘opportunity structure.’ The Measuring Empowerment (ME) framework recognizes that empowerment variables can interact and are connected. However the overarching comparative goal of this study necessitates a separation of the empowerment that is institution-based and that which is individual-based. The empowerment literature recognizes that various aspects of empowerment may interact and reinforce each other but they can nevertheless be distinguished so as to lay emphasis on one.

Several studies are based on the relationship between the institutions and individuals. Institutional reforms aimed at benefitting individual farmers are not always. Studies on the relationship between institutional frameworks, agency and benefits to the intended recipients are therefore critical in development studies. The separation of institution-based and individual-based empowerment is acknowledged in the study by Lema and Kapange (2006). They state that farmer empowerment for agricultural innovation in Tanzania has two components. The first is strengthening farmer empowerment and the second is strengthening farmer organizations. The thesis by Varqa (2008) concludes that it is the extent of the quality of governance within institutions that support the implementation of state policies that makes a crucial difference in reforming and improving sectoral and economic performance, rather than the policies used to respond to underdevelopment.

In his thesis, Karanja (2002) noted that despite the market reforms of the previous decade, agricultural production and market participation by smallholder farmers in Kenya had continued to decline. Mahdi (2008) examines how institutional and regulatory arrangements can depress agricultural market outcomes, particularly for the smallest and the poorest stakeholders. He argues that these regulations contribute more to the cost of doing business than to the quality of the regulatory environment. In conclusion, he states that overall, the result is a market that underwent macro level reforms but did not have the expected micro level impact in terms of productivity, incomes and overall farmer livelihoods.

Several indicators are used for the institutional framework. These include access to productive resources including credit, inputs and agricultural extension (Thuku, Gachanja & Obere, 2013; Bargawi, 2008; Ponte, 2002; Mahdi, 2008; Kalinda &

Chibwe, 2014; Okibo & Mwangi, 2013; Condliffe, Kebuchi, Love & Ruparell, 2008; Gitu, 2012; Nkurunziza, 2014; Nduati, 2012). Another indicator is access to industry information (Kalinda & Chibwe, 2014; Condliffe, Kebuchi, Love and Ruparell, 2008; World Bank (WB), 2005). The WB (2005) for example notes that while milling costs do not vary remarkably between millers, the separation of farmers from information regarding their crop grade and classification limits the ability of farmers to make improvements. The coffee grade is based on the coffee bean size while classification is based on the cup quality.

A third indicator is the ability to choose. The study by Collinson, Kleih, Burnett, Muganga, Jagwe & Ferris (2005) states that research conducted in Uganda and other countries in sub-Saharan Africa reveals that certain attributes are common to successful Farmer Controlled Enterprises (FCEs). Groups evolve from within the farming community and are self-selecting, they are genuinely democratic and group activities are relatively simple and within the capacity and capability of the members. A fourth indicator is access to social resources (Mhando, Haller, Mbeyale & Ludi, 2013). Numerous studies also lay emphasis on economic benefits to farmers. Economic benefits to farmers can be attained through increased coffee prices, increased productivity which refers to a higher yield per coffee tree, reduction in operational costs, or higher quality of coffee that attracts a premium (Thuku, Gachanja & Obere, 2013; Ponte, 2002; Kalinda & Chibwe, 2002; Chiuri, 2011; Kamau *et al*, 2011; Gitu, 2012; Okibo & Mwangi, 2013; Nduati, 2012; Mhando, Haller, Mbeyale & Ludi, 2013; Nkurunziza, 2014).

Farmer agency or individual-based empowerment is also acknowledged in various studies such as Karanja (2002) where farmer efficiency in the advent of market reforms is considered and Gitu (2012) which found that coffee cooperative members with higher levels of education receive higher incomes from coffee but there was no significant difference in participation found between the different levels of education. This study also included other indicators of farmer agency such as land size and income as well as demographics such as age, sex and marital status. Kamau *et al*

(2011) used the number of coffee trees owned by coffee cooperative members as an indicator of uniformity.

The coffee sector however has a dynamic institutional framework with both formal and informal elements. The study by Bargawi (2008) for example aimed to reassess the institutional arrangements in the coffee and cotton sector and analyze the formal and informal institutional responses that have emerged in response to these challenges. Studies based on the coffee sector therefore aim as part of their objectives, to characterize it by describing the coffee chain actors and processes as well as examining and analyzing the structure and function of the institutions in the coffee sector (Ponte, 2002; Orozco, 2009; Poulton & Kanyinga, 2013; Kenya National Assembly Record (Hansard), 2005; Itika, 2005; Mahdi, 2008; Kalinda & Chibwe, 2014; Lema & Kapange, 2006; Mhando, Haller, Mbeyale & Ludi, 2013; Nkurunziza, 2014; Mujawamariya, 2007).

Failure to consider institutional frameworks has led to dismal performance of development interventions. Liberalization for example altered the institutional framework in the coffee sector with the aim of empowering small scale farmers by increasing the actors in the coffee commodity chain and thus availing more choices. It was expected that competition among millers, marketers and buyers would result in lower costs and higher prices for small scale farmers. While the multiplicity of actors availed more choices to farmers, the capacity to appropriate these choices is contingent on a farmer's institutional frameworks. The literature on empowerment explains that the availability of choices does not automatically translate to farmer empowerment. Empowerment requires not only choices but the capacity to access these choices and benefit from them.

According to the NIE theory, a relationship exists between institutions and economic growth and conversely, economic growth and development often result in a change in institutions (Kherallah & Kirsten, 2001). In explaining the role of institutions in economic development, Klein (1990) states that economic depends on the degree to which potential hazards of trade can be controlled by institutions. The TCE also states that cost of transacting which is determined by institutions and institutional arrangements is the key to economic performance (Kherallah & Kirsten, 2001). In

analyzing the relationship between the institutional framework and economic benefits, this study is therefore anchored on the theories of NIE and TCE. While farmers engage in production within the institutional framework, they also have personal agency, which is the capacity to envisage options and make a choice (Alsop & Heinsohn, 2005). The CA approach in this study enables an analysis of the moderating role of farmer asset-based farmer agency in the relationship between the institutional framework and economic benefits. The institutional framework can constrain the capability of farmers and therefore limit the effectiveness of agency in gaining economic benefits.

#### a) Institutional Frameworks of Coffee Cooperatives

Kheralla and Kirsten (2001) state that cooperatives and farmer organizations are institutional arrangements, whose importance re-emerged to organize small farmers in developing countries following agricultural market liberalization. In their study of cooperatives in Mexico, Jorgensen and Muller (2003) examined producer cooperatives as a socio-institutional framework for rural development. Cooperatives are therefore viewed as being a solution to disempowerment. Numerous objectives of cooperatives are cited in the literature. These include to reduce costs, access credit, improve the negotiating power of smallholders, develop more efficient techniques, improve research and technology transfer, achieve effective markets, shorten the supply chain through direct interactions with exporters and processors, improve production and quality of coffee, process, store and transport coffee (ICO, 2015; Kheralla & Kirsten, 2001; Varqa, 2008). It is however noted that despite the aim of cooperatives to benefit members, the history of traditional cooperatives suggests that cooperatives have not always been successful at serving the needs of its members (Kheralla & Kirsten, 2001).

Mude (2006) for example notes that while there is a general consensus that empowering the poor to take a proactive role in their development should be a central pillar of development efforts, it is not as clear that membership based organizations are always the most effective means to improving the welfare of its members. It is hypothesized that the marked deterioration of coffee cooperatives in Kenya can be partly explained by institutional changes in cooperative organization

that gave full ownership and administrative control to members, because the rules for electing cooperative leaders lend themselves to corruption, reducing the efficiency and welfare of members. Varqa (2008) notes that similar to other coffee producing countries, coffee and politics in Kenya are closely inter-related. She observes that the political influence on the coffee sector in Kenya has mainly been exercised through the institutions using policies and law and notes that cooperatives are influential institutions as they act as a network through which state policy and regulations are channeled to members.

In their study Collinson, Kleih, Burnett, Muganga, Jagwe and Ferris (2005) found that farmers' bargaining power can be improved through pooling of produce which allows for economies of scale through the formation of farmers' marketing groups also known as Farmer Controlled Enterprises (FCEs). This enables produce to be sold to actors further up the marketing chain thereby eliminating at least one level of middlemen, resulting in better net farm-gate prices. It also encourages the improvement and standardization of quality to meet the more stringent contractual quality specifications demanded by larger buyers.

Most studies on coffee cooperatives identify aspect in their institutional framework that leads to farmer empowerment or disempowerment. These include aspects such as corruption, management issues, access to productive resources, access to information, negotiating power of farmers, low economic benefits, numerous players in the chain, poor coffee tree varieties and farming practices, huge debts, politics in the management of coffee societies, increased coffee theft because of liberalized marketing, fragmentation of cooperative unions resulting in reduced economies of scale, insecurity due to increased levels of cherry hawking, limited government support including poor marketing by the government, high operational costs in the organizations serving farmers, costs of repaying World Bank funded loans and poor investment decisions, mishandling of loans, co-operative payments not contingent on the quality of the coffee and the time at which the farmers delivered their coffee, not fulfilling contracts in a timely manner, marketing difficulties (Chiuri, 2011; Okibo & Mwangi, 2013; Gitu, 2012; Mhando, Haller, Mbeyale and Ludi, 2013; Nkurunziza, 2014).

Recommendations proposed in the literature to these challenges include better information on the coffee sectors' various institutions and a consideration of whether the same or more important functions can be better or more cheaply performed under different institutional arrangements, efforts to increase competition, reduce corruption and reform governance structures, dissemination of information on cooperatives, improved links between cooperatives and buyers and addressing the disruptions caused by liberalization including reduced access to credit and agricultural inputs and an absence of management capacity, government support for cooperatives to build capacity in the short-term, as well as public-private partnerships, support in the development of farmers' cooperatives as a channel for vertically integration by the farmers (Condliffe, Kebuchi, Love & Ruparell, 2008; Nkurunziza, 2014).

Some studies on coffee cooperatives have focused on particular aspects, such as the study by Kamau *et al* (2011) to estimate the impact of UTZ certification on the welfare of coffee farming households and to assess changes in farm household's perception on various issues arising from the certification program. The study by Gitu (2012) focused on member participation in cooperatives. It sought to determine whether a member's level of education, income, land size, sex, marital status and age of members limit their participation. It also sought to prescribe policy from findings that would allow for better collaboration between members and their cooperative societies. Nduati (2012) investigated the factors which influence service provision by cooperative societies in Kenya with a case study of cooperative societies in Kigumo district. These factors included governance, coffee price fluctuations and access to credit. The study included a comparison of marketing through cooperatives as opposed to alternative channels. The Centre for International Development Issues Nijmegen (CIDIN), (2014) compared two cooperatives, one whose coffee was Utz certified and the other whose coffee was both UTZ and Fair Trade certified. Mujawamariya (2007) used TCE theory to also compare co-operative member farmers and non-members in Rwanda.

It is noted that despite cooperatives' efforts to attract members through the provision of inputs, technical advice and other incentives, membership adherence was low and

slow. The study noted that there were critical dimensions according to which transactions differ and which subsequently influence the relative efficiency of various organization structures. This included the way in which exchanges or institutional arrangements were organized in terms of contracts regime, incentives and control regimes. While co-operatives have the aim of empowering members through collective purchasing and bargaining, various studies have pointed out the disempowering effect of coffee co-operatives on farmers, due to issues such as mismanagement and corruption (Chiuri, 2011; Gitu, 2012; Monroy, Mulinge and Witwer (2013); Nduati, 2012; Thuku, Gachanja & Obere, 2013). Zamora (2013) noted that farmers in cooperatives comprise the majority of coffee farmers in Kenya. The dominance of cooperatives has resulted in academic research as well as policy and development interventions in the coffee sector being centered on aspects revolving around cooperatives only. Studies with this focus include Mude (2006), Wanyama (2009), Chiuri (2011), Nduati (2012), Gitu (2012) and Okibo and Mwangi (2013). Prior to liberalization and the fragmentation of cooperative societies, there were only four coffee cooperative societies in Nyeri county; Mathira with 36 factories, Mukurweini with 28, Othaya with 19 and Tetu with 18 (NCCT, 2013). There are currently 99 factories divided between 23 cooperatives. The number of factories under each co-operative varies greatly, with Othaya having 19 factories while 10 co-operatives have only one factory each.

#### b) Institutional Framework of Certified Coffee Cooperatives

Certification is a means of increasing farmer empowerment and is done through certifying that coffee has been produced, processed and marketed in adherence to given standards. This is aimed at increasing the value of coffee and therefore earning coffee farmers a higher pay. In addition to the economic empowerment aspect, certifications also have social and environmental aspects that include labour standards and environmental sustainability. Certified coffees are defined by Lentijo and Hostetler (2017) as those that take into account one or more aspects of sustainability including economic, environmental and social aspects. It is explained that certification programs are a result of an increased awareness among consumers

of the impact of their consumption habits on the people and the environment in coffee producing countries (Kamau *et al*, 2011).

Coffee certification refers to a system that distinguishes a coffee product as being sustainably grown on the basis of economic viability, environmental conservation, social responsibility and ensures traceability (AFFA, 2015). Various certification program focus on certain aspects of production and marketing, particularly as regards to quality, labour and environmental standards. In the coffee sector in Kenya, the coffee certification programs include Fair Trade, Utz and RainForest Alliance. The requirements of Fair Trade include transparency in the coffee supply chain, decent production conditions and the addressing of key obstacles that prevent poor farmers from accessing markets. Benefits include a selling price that meets the farmers' basic needs and a positive environmental impact due to sustainable production techniques (Gresser & Tickel, 2002). It involves paying producers an above-market "fair trade" price if they meet the specified requirements. It also pays a premium which is retained by the cooperative and the farmers vote on how this will be spent for their collective use (Haight, 2011).

The UTZ certification requires better working conditions, farming methods, care for nature and for future generations. Its standards are geared at contributing to a better crop, income, environment and life (UTZ Certified, 2013). Traceability is the most important part aspect of UTZ certification and consumers therefore know the source and production process of the coffee (Lentijo & Hostetler, 2017). Rainforest Alliance Certification has requirements that include conserving biodiversity and ensuring sustainable livelihoods by transforming land-use practices, business practices, water and soil protection and the fight against pests. The 4C-Common Code for the Coffee Community promotes sustainable social, economic and environmental practices, and was originated to unify the various certification criteria. Its principles encompass all the actors in the coffee chain including the farmers, producer organizations, mills, exporters and traders (Lentijo & Hostetler, 2017). Starbucks C.A.F.E. Practices is a certification that evaluates the economic, social, and environmental aspects of coffee production. C.A.F.E. is an acronym for Coffee and Farmer Equity and its guidelines

focus on four areas: high quality, economic accountability, social responsibility and environmental stewardship (Lentijo & Hostetler, 2017).

Despite the objectives and benefits of certification, it is noted that there are coffee chain actors including coffee growers, roasters and importers who believe that Fair Trade-certified coffee is not fulfilling its aim of poverty reduction (Haight, 2011). It has also been stated that farmers could benefit more through direct trade (*ibid*, 2011) and that although certification is rewarded by higher prices, the marketplace for green coffees primarily rewards quality (Kegode, 2005). Additionally, guaranteed prices to the cooperative do not necessarily mean that the farmer receives this price (Haight, 2011).

#### c) Institutional Framework of Coffee Estates

Information and data on Coffee Estates in Kenya is predominantly comparative as it is presented in tandem with cooperative analysis. A comparison by Monroy, Mulinge and Witwer (2013) of processing and market access costs between smallholders and estates revealed significantly higher costs for smallholders in cooperatives. It was noted that these higher processing costs appeared to be associated with the management of the cooperatives. It was suggested that better management and more competition at the primary processing level should effectively eliminate the gap between smallholder and estate processing costs. It was also observed that there were several features of coffee value chains in Kenya that had significant impact on outcomes.

Among the key ones were the dual structure of production split among cooperatives serving small-scale growers and large-scale Coffee Estates, with very little production by mid-size growers. Another issue was the highly centralized and regulated marketing system and lack of marketing options or competitive structures. This refers to the marketing of coffee through the auction which is the primary method of coffee sales. Fees are also levied for research, the marketing board and rural roads. The dominant role of cooperatives serving small-scale growers was also cited, as were the long delays between the delivery of coffee cherry and payment for small-scale growers.

A key informant in the study by Gitu (2012) suggested alternative organization of small-scale farmers in Kenya which involve the removal of fence lines to enable estate style production of coffee. This would take advantage of the economies of scale at the production stage which does not currently occur with the cooperative arrangement. Estates are deemed more productive as they are professionally managed and have access to credit (Condliffe *et al.*, 2008). Estates contribute 40 per cent of the total production in Kenya (ICO, 2015). Nyeri County had a total of 169 licensed estates for the 2015/2016 year and the available information is illustrated in Table 2.1 in terms of acreage and district where estate is located. Several estates are corporately owned but as the information depicts, most estates are between 2 ha and 10 ha.

**Table 2.1 Nyeri County Coffee Estates by Acreage**

Acreage (ha)		Number of Coffee Estates
2.0	-	2.5
70		
2.6	-	5.0
45		
5.1	-	10.0
31		
10.1	-	20.0
4		
20.1-		50.0
5		
50.1	-	100
4		
Over		100
4		

---

Total
163

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Note: Data sourced from AFFA Nyeri office

In Table 2.1, the first column depicts the range of acreage in hectares while the second column depicts the number of licensed estates in Nyeri County with that acreage. This shows that the majority of estates are below 5 hectares, with 115 of the 163 estates falling in this category. This represents 71 per cent of the estates.

Table 2.2 Nyeri County Coffee Estates by District

---

District	Number of Coffee Estates
Nyeri	54
Mukurweini	49
Mathira	28
Tetu	15
Nyeri	8
Kieni	5
Kieni	3
Mathira	

---

---

3

Othaya

1

Total

166

---

Note: Data sourced from AFFA Nyeri office

In Table 2.3, the first column lists the districts (currently referred to as sub-counties) of Nyeri County and the column on the right shows the number of Coffee Estates licensed in that district. As depicted, Othaya cooperative had the least number of estates while Nyeri Central had the highest.

It is pointed out by Bardhan (1989) that according to TCE, institutions that evolve to lower transactions costs are the key to the performance of economies. The study cites the NIE theory that the basic source of institutional change is fundamental and persistent changes in relative prices, which lead the parties in a transaction to perceive that they could be better off under alternative contractual and institutional arrangements. The study however argues that this is inadequate in explaining institutions' existence and cites the viewpoint espoused by Marxism that whether and how institutions change depends on considerations of surplus appropriation by a dominant class. Ponte (2002) notes that the forms of coordination among actors and the type of contracts formulated to organize their operations are key to understanding whether institutions arising from liberalization simply effect changes in transaction costs or whether they also embed forms of asymmetrical power relations.

Kheralla and Kirsten (2001) use NIE theory to analyze the relationships between the farmer and the agribusiness. Bracking (2003) uses NIE to examine the factors that explain economic disempowerment, evidenced in the denial of effective economic participation. Collinson *et al* (2005) use TCE theory to analyze marketing and transaction costs along the marketing chain, from the farm gate to tertiary markets

(domestic and export), of six strategic commodities, including coffee. The key objective of the study by Collinson *et al* (2005) was to recommend implementation plans that would overcome constraints to marketing and processing efficiency and improve farm-gate prices to smallholders.

### **2.2.7 Economic Benefits as the Dependent Variable**

Economic Benefits was the dependent variable in this study with the proxy for economic benefits being the main income for the 2015/2016 year. After coffee is sold at the auction, the marketing agent after deducting their commission remits the payment to the cooperative. The cooperative then deducts the operational expenses before calculating the payout price. The payout price is calculated by dividing the payment received by the kilograms of cherry that were delivered by the farmers. Since operational expenses vary between factories in the same cooperative, the payout price also varies between factories in the same cooperative. In this study, economic benefits referred to farmer income and it was calculated as the payout price multiplied by the number of kilograms of cherry the farmer had delivered.

In 2013/2014 as in previous years, about 90 per cent of coffee was auctioned at the NCE with the remainder sold in direct sales (KCCE, 2017). A Master's thesis done by Kuhlin and Modig (2009) studied the competition at the Kenyan and Tanzanian Coffee Auctions. They concluded that both the Kenyan and Tanzanian coffee markets, at the auction level, are close to being perfectly competitive but noted that nothing could be said as to whether the coffee farmers got a fair share of revenues and profits created at the auction levels. They however noted that due to the structure of the first stages of the value chain with hundreds of thousands of small coffee and farmers and because of the economic situation of most small holder, they did not find it very likely that farmers would get a large share of the revenues. According to Monroy, Mulinge and Witwer (2013), the auction system provides an extremely transparent mechanism to determine price at the whole sale level and provides

incentives to produce high quality coffee (Thuku, Gachanja & Obere, 2013). The payout price is also determined by the costs deducted. WB (2005) notes that the value chain allows for a disaggregation of costs up and down the supply chain enabling the key market- and policy-based impediments to be identified.

Kheralla and Kirsten (2001) explain that grades and standards play a crucial role in providing internationally recognized information and quality assurance about a product thereby reducing information and transaction costs and facilitating international trade. Grades and standards can however also be used as non-tariff barriers to trade if importing countries impose minimum standards that are unreachable by many developing countries. Using NIE and TCE theory, grades and standards are perceived as the institutions that govern exchange in international markets. While the assumption would be that a rise in prices would result in a rise in production, this has been disputed. Mhando, Haller, Mbeyale & Ludi (2013) noted that despite a stated rise in producers' share of the export price in Tanzania, there was no evidence of an increasing trend in coffee production. Two reasons were given for this. The first was that due to constant fluctuations in coffee prices, farmers do not trust the coffee market. The second was that farmers prefer to expand their livelihood base by investing in different income-generating activities rather than expanding coffee production, due to their experience of earning less income if they expand production. This demonstrated that a sole focus on coffee production would not be an accurate measure of the levels of empowerment.

According to the Economic Survey (2015), coffee production increased from 39.8 thousand tonnes in 2012/13 to 49.5 thousand tonnes in 2013/14. There was a minimal increase in the area planted under coffee from 109.8 thousand ha in 2013 to 110.0 thousand ha in 2014. The area under coffee in cooperatives and estates increased by 100 ha each during the year under review. However, production in estates declined for the second year running. Despite depressed production in the estates, the coffee sub-sector recorded an overall increase in production of 24.4 per cent from 39.8 thousand tonnes in 2013 to 49.5 thousand tonnes in the review period. This was

largely from the cooperative sub-sector which recorded a 49.3 per cent increase from 21.9 thousand tonnes in 2013 to 32.7 thousand tonnes in 2014. The average yield for the cooperative sector increased by 48.4 per cent while that of the estates decreased by 5.0 per cent.

### **2.2.8 Farmer Agency as a Moderating Variable**

Alsop and Heinsohn (2005) explain that the extent or degree to which a person is empowered is influenced by personal agency which is the capacity to make purposive choice, and opportunity structure, which is the institutional context in which choice is made. Agency was therefore hypothesized in this study to moderate the relationship between the institutional framework and economic benefits. Asset-based agency was used as it is most pertinent to a farmer's capability in his role as an economic actor. Asset endowments are used as indicators of agency and these assets can be psychological, informational, organizational, material, social, financial or human (Alsop & Heinsohn, 2005).

This study used psychological, organizational, material, financial and human assets as they are the most applicable. The indicator for psychological assets was confidence in their ability to increase yields and improve quality, their perception of the coffee sector and their coffee production plans for the next three years. The indicator for organizational asset was membership in an economic self-help group. This is because economic resources from self-help groups can be put towards coffee production, or alternatively, stop resources meant for coffee production being diverted to other uses. The indicator for material asset was the acreage under coffee as this determines the possibility of engaging in primary processing while still in a cooperative or opting out of cooperative affiliation. The indicator for financial assets was alternative sources of income as this can be used to enhance coffee production, while the indicator for human capital assets was the years of schooling and the years engaged in coffee farming.

The study by Parrish, Luzadis and Bentley (2005) examines two prominent market-based interventions, Fairtrade certification and TechnoServe business development, as they are implemented in two coffee producer organizations in Tanzania. Data was analyzed using the sustainable livelihood framework which is used to understand and analyze livelihood strategies of the poor. Seven dimensions of analysis were identified from this framework, with which to evaluate the interventions and include five forms of capital; financial, human, physical, social and natural, and two institutional dimensions; processes and structures. The study finds that the two interventions are complementary. Conditions requiring increased supply-side production efficiency would be well served by TechnoServe's approach, while conditions requiring demand-side market creation are well suited to a Fairtrade-styled approach. In this study, the asset-based indicators of agency used were derived from a review of the literature so as to include those considered most pertinent.

### **2.3 Critique of Literature**

Numerous studies have pointed out the ineffectiveness of coffee cooperatives but other forms of production organization besides cooperatives have remained largely uninvestigated. There is a lack of studies focusing on the more than 3000 small Coffee Estates. Production institutional arrangements provide a critical area that warrants empirical analysis to justify or discount the continued existence of coffee cooperatives as the major and legally mandated producer arrangement for most of Kenya's small-scale coffee farmers. This is essential as mandatory cooperative membership under prohibitive circumstances can result in small-scale farmers opting out of coffee production or engaging in illegal selling of their coffee.

In view of the on-going implementation of decentralization measures in Kenya, an analysis of institutional arrangements is critical. Devolution in Kenya has led to numerous changes in both the political and economic domain, with functions previously undertaken by the national government being decentralized to the county

government, including the management of the agricultural sector. These include some agricultural functions as specified in the AFFA (2013). This has significant implications for small-scale coffee farmers as the Act alters their institutional arrangement. This is particularly significant in counties such as Nyeri which has implemented extensive changes in the milling and marketing stages of the coffee chain. It is therefore imperative to examine producer institutional frameworks for the purpose of gauging whether they facilitate or constrain benefits to farmers. This can be done through a comparative measure of the empowerment levels of farmers operating within the various institutional arrangements. This comparative analysis has critical implications for policy formulation and implementation as both state and non-state actors can discern the capability of recipients to benefit from the opportunities availed in these institutional frameworks. Empirical evidence of the economic benefits derived will validate or negate presumptions of farmers' access and benefit of opportunities. It will therefore reduce the probability of a faulty policy formulation and implementation process.

## **2.4 Research Gaps**

Literature on the coffee sector in Kenya is focused on co-operatives, because they are the predominant Producer Institutional Arrangement. Distinction is made between the traditional state-controlled co-operative and the emerging farmer-controlled arrangements referred to as farmer organizations, producer organizations and farmer controlled enterprises. While the institutional frameworks of these arrangements differ, the overarching distinction between them is in the impetus of their formation; whether emanating from the government or from farmers. Although the coffee co-operatives in Kenya have undergone liberalization, membership is still legally mandated for small-scale farmers. They are therefore more closely aligned to the traditional state-controlled organizations. Literature is also largely focused on various aspects and effects of liberalization, including analysis of various actors and processes in the coffee chain and the opportunities and challenges along the chain..

This study included Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates, to fill the research gap caused by a focus on cooperatives and a non-distinction of the certified and non-certified cooperatives. It will also focus on the post-devolution period which will enable an analysis of the interpretation and effect of the Coffee Rules under the AFFA, 2013. The concept of empowerment and agency will fill the conceptual gaps as studies on the coffee rarely take this into consideration, despite increasing recognition of both as being instrumental in development. The methodological gap will be filled by sampling all cooperatives in Nyeri County, rather than conducting case studies of one or two cooperatives. The use of TCE in disaggregating the costs in the coffee chain will enable an understanding of the efficiency or inefficiencies in the operations of the Producer Institutional Arrangements. NIE theory informs the methodology through an inclusion of the implications of different institutional arrangements while the CA theory informs the inclusion of agency as a moderating variable in this study.

Monroy, Mulinge and Witwer (2013) suggest a number of areas where further work would be useful. These include the use of more recent data on primary and secondary market access costs and an evaluation of alternative marketing systems, especially those which may provide more choices to producers. Economic benefits while focusing on income, will also analyze the contributory aspects to income, namely production, price and quality. Okibo and Mwangi (2013) focus on the effects of liberalization on coffee production. While there are studies that focus on single aspects of the coffee commodity chain or on particular actors, this study sought to analyze the actors and their activities along the entire commodity chain. This enabled an overview as well as a comparison across cooperatives, which made it possible to identify potential areas for upgrading in the chain. Another research gap has been in the use of aggregated information and data pertaining to the coffee sector. Data on factories within the same cooperatives enabled an analysis within and between various arrangements. Information from small estates enabled a comparative analysis which would justify or invalidate the efficiency of cooperatives in the organization of production.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter provides the design and methodological approach that was used in the study to meet the objective of analyzing the relationship between Producer Institutional Arrangements in the coffee sector and their effect on the economic benefits of farmers. It discusses the research design, population and sampling frame, sampling size and sampling technique, data collection instruments, data collection techniques, data collection procedure, pilot test, reliability and validity of the data collection instrument, as well as data processing and analysis.

#### **3.2 Research Design**

A research design is the plan or proposal to conduct research (Creswell, 2009) and it involves a set of decisions regarding what topic is to be studied, among what population, with what research methods and for what purpose (Babbie, 2010). This research involved a study of the Producer Institutional Arrangements which coffee farmers in Kenya engage with. The population studied was the coffee farmers in Nyeri County. This study was based on a positivist philosophy approach and used a cross-sectional research design. Questionnaires were used to obtain information from the coffee farmers while interview guides were used to obtain information from key informants from each of the 23 coffee cooperatives in Nyeri County. Data analysis employed open and thematic coding and multiple regression.

#### **3.3 Population**

A population is defined as the complete set of relevant units of analysis or data (Nachmias & Nachmias, 2000). The sample population of this study was coffee farmers in Nyeri County. Nyeri County is one of the 47 counties in Kenya and it was picked for this study for several reasons. It was the highest producer of coffee in the

country and considers the coffee sector key to its economic growth (NCCT, 2013). It also encompassed both certified and non-certified cooperatives, with approximately 100,000 farmers in coffee cooperatives and over 160 Coffee Estates at the start of the study with. Nyeri County has also undertaken fundamental changes to the coffee chain in its interpretation of the AFFA Act (2013) which pertains to the devolution of the agricultural sector in Kenya. The study only included farmers who had been engaged in coffee production for a minimum of the three years prior to the study.

### **3.4 Sampling Frame, Size and Technique**

#### **3.4.1 Sampling Frame**

A sample's representativeness depends directly on the extent to which a sampling frame contains all the members of the total population that the sample is intended to represent (Babbie, 2010). The sampling frame comprised the coffee farmers in Nyeri County and was derived from the AFFA-Coffee Directorate, Nyeri Office and the Nyeri County Cooperative Office while coffee cooperatives provided member information. There were 23 coffee cooperatives in Nyeri County with 99 factories between them and 169 Coffee Estates licensed for the 2015/2016 year. Corporate Coffee Estates were not included in this study as the unit of analysis was the individual coffee farmer.

#### **3.4.2 Sample Size**

The sample size for this study was calculated using a formula suggested for estimating sample sizes in social surveys by Fisher, Laing and Stoeckel (1983). This formula was chosen as it is applicable to populations over 10,000, which is the case in this study as there are an estimated 100,000 coffee farmers in Nyeri County.

$$N = Z^2 pq / d^2$$

Where:  $N$  is the desired sample size if the target population  $> 10,000$

$z$  is the standard normal deviate at the required confidence level

$p$  is the proportion in the target population estimated to have the characteristic (assume 50 per cent if unknown)

$q = 1 - p$  and  $d$  is the level of statistical significance or *Alpha*

This study used a confidence level of 95 per cent.

Therefore  $z = 1.96$ ,  $p = 0.5$ ,  $q = 0.5$  and  $d = 0.05$       $N = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384.16$

This resulted in a sample size of 384.

### **3.4.3 Sampling Technique**

The study used stratified random sampling with equal allocation. This sampling technique was selected due to large differences in the number of farmers per institutional arrangement, which rendered the use of a proportionate sample size based on the number of farmers per arrangement or the number of institutional arrangements impractical. Stratified random sampling with equal allocation is used when the same level of precision is required for each stratum and each stratum is allocated an equal number of sample units.

$$n_h = n/L$$

where:             $n$ =sample units;  $L$ = number of strata;  $n_h$  = sample size in stratum  $h$

Under this sampling technique, the sample of 384 was equally divided among the three institutional arrangements-Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates. This resulted in a sample size of 128 under each institutional arrangement ( $384/3=128$ ). This method of disproportionate stratified sampling is used to either compare two or more particular strata or to analyze one stratum intensively (Nachmias & Nachmias, 2000).

Based on the number of factories in the certified and Non-certified Coffee Cooperatives, two respondents per factory in the Certified Cooperatives and four respondents per factory from the Non-Certified Cooperatives were sampled. Questionnaires were administered to the respondents who were coffee farmers from both the cooperatives and estates, while interviews with key informants were conducted in each of the twenty-three coffee cooperatives. Sampling for estates was

done by estates being stratified by district then randomly sampled. Due to high attrition rates in the estates, a census was preferred.

### **3.5 Data Collection Instruments**

This study used questionnaires which were administered to the coffee farmers and key-informant interview guides which were used to collect information from key informants in all the 23 coffee cooperatives.

#### **3.5.1 Data Collection Techniques and Procedure**

This study utilized primary data collected through questionnaires and key-informant interviews. To identify the population of the study, a list of licensed Coffee Estates was obtained from the Coffee Directorate office in Nyeri. The Coffee Directorate is one of the directorates under the Agriculture, Fisheries and Food Authority, which is the regulatory body of agriculture in Kenya. This list included the estate farmers' names and telephone number, which was used to contact them. A list of coffee cooperatives was obtained from the Nyeri County Cooperative Office. The district cooperative officers then gave a list of the chairpersons or secretary-managers in the cooperatives.

Key-informants interviews were administered to the secretary-managers in each cooperative, or to the staff person they designated. At the cooperative offices, a list of farmers was obtained and the sampled farmers had the questionnaire administered to them via telephone. Enumerator-guided questionnaires were used as a means of getting a higher number of respondents over a wider geographic area, as a large number of farmers engage in other activities and were not guaranteed to be available on the coffee farm. Interviewing the farmers at the cooperative premises would exclude farmers who were unable to avail themselves, as well as impute transport costs for them.

##### **a) Questionnaires**

Questionnaires were administered to the coffee farmers. The principles of ethical consideration were observed in the research process. Participants were informed of

the nature of the study prior to the interview. This included being informed that the study was part of doctoral study and that they were not being compensated for taking part in the study. This was to ensure participants gave informed consent. Assurance was also given that the information given would be confidential and that the identity of respondents would be anonymous. This was done by removing the cover page with identifying information from the questionnaire.

A pilot test was performed by administering the questionnaire to 10 farmers from Thiriku Cooperative who were not part of the sample to measure reliability of the data collection instrument. The Cronbach Alpha was used as it assesses the reliability of the test items used, that is, whether they are a consistent measure of a concept. The cutoff rate given by Hair et al (2006) of  $\alpha$  is 0.7 for internal consistency of the instrument. The Cronbach's Alpha ( $\alpha$ ) was computed as:

$(\alpha) = Nr/(1 + r(N-1))$  Where:  $r$  is the mean inter-item correlation and  $N$  = number of items in the scale.

#### b) Key-Informant Interviews

Interviews are primarily used to gain an understanding of the underlying reasons and motivations for people's attitudes, preferences or behaviour They may be categorized as structured, semi-structured and unstructured (Maina, 2012). Advantages of this method include a good response rate, possible in-depth questions, and uniformity of approach if there is one interviewer and can be used to pilot other methods of inquiry. Disadvantages include the need to set up interviews, time consuming, geographic and financial limitations and respondent bias (*ibid*, 2012). Semi-structured key-informant interviews were conducted in all twenty-three coffee cooperatives in Nyeri County. This was done through the use of a key-informant interview guide.

### **3.6 Data Processing and Analysis**

Data processing connects data collection and data analysis. Data processing in this study involved editing, coding, classifying and tabulating the primary data collected. Descriptive statistics summarized the data on the variables and were used in the first

specific objective which pertained to characterizing the Producer Institutional Arrangements. This included open coding and thematic coding which entailed the organization of the data into common themes and preparation of summaries. Quantitative analysis included inferential statistics which were used for the second and third objective. For the second objective, multiple regression was used to examine the relationship between the Institutional Framework and Economic Benefits to farmers. A moderated multiple regression was used for the third objective whereby Farmer Agency was hypothesized to intervene in the relationship between the Institutional Framework and Economic Benefits. The indicators for the variable under study are shown in Table 3.2.

**Table 3.1 Measurement of Variables**

Variable	Indicators	Measurements	Questionnaire section
Institutional Arrangement	Certified Coffee Cooperative	Membership in a coffee cooperative for the last three years	1.2.1
	Non-certified Coffee Cooperative	Membership in a coffee cooperative for the last three years	1.2.1
	Coffee estate	Ownership of coffee estate for the last three years	2.1.1
Institutional Framework	Ability to choose, decide and hold accountable	Ability to choose management or leadership, miller, marketer and buyer	3.1.1.
	Ability to negotiate	Ability to negotiate with coffee chain actors; millers, marketers, buyers	3.1.2
	Access to industry information	Information on industry actors and processes.	3.1.3
	Access to productive inputs	Access to adequate, affordable and timely agricultural extension, inputs, tools and credit.	3.1.4
	Access to health and education benefits	Access to health and educational benefits through the institutional arrangement	3.1.5

Economic benefits	Coffee income for 201/2016 year	Payout price multiplied by cherry production in kilograms	5.1/6.3E
Farmer Agency	Psychological assets	Ability to increase yields and improve quality, perception of coffee sector, production plans for the next three years.	4.1.1 4.1.2
	Material assets	Number of coffee trees	4.1.3
	Financial assets	Alternative source of income	
	Human capital assets	Years of schooling and years of coffee farming	4.1.4 4.1.5
	Organizational assets	Membership in financial self-help group	

---

The indicators of the institutional framework comprised the independent variable while the indicator of economic benefits comprised the dependent variable. These were used in the multiple regression analysis to determine if there was a relationship between the institutional framework and economic benefits. The indicators of farmer agency comprised the moderating variable for the moderated multiple regression in establishing if farmer agency moderated the relationship between the institutional framework and economic benefits. This regression analysis was performed separately for the three institutional arrangements- Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates, as well as combined for all three institutional arrangements.

Multiple regression was used to determine the relationship between the institutional framework and economic benefits and the linear equation was:

$y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + \varepsilon$  for the relationship between the independent and dependent variables where  $y$  is the predicted criterion score/dependent variable,  $B_1$  to  $B_5$  were the regression weights associated with the predictors and  $X_1$  to  $X_5$  were the values of the predictors/independent variable and  $B_0$  is the constant (the  $y$ -intercept). In this study,  $y$  = economic benefits which was indicated by the 2015/2016 coffee income.  $X_1$  was the ability to choose, decide and hold accountable,  $X_2$  was the ability to negotiate,  $X_3$  was access to productive inputs,  $X_4$  was access to industry information,  $X_5$  was access to health and economic benefits and  $\varepsilon$  was the error term.

Moderated multiple regression was used to establish the extent to which farmer agency moderated the relationship between the institutional framework and economic benefits and the linear equation was:

$y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6Z + B_7X_1Z + B_8 X_2Z + B_9X_3Z + B_{10}X_4Z + B_{11}X_5Z + \varepsilon$  for the relationship between the moderating and dependent variables.  $X_1$  to  $X_5$  and  $Z$  and  $Z_1$  to  $Z_6$  are the values of the predictors and  $B_0$  is the constant (the  $y$ -intercept). The moderating variable ( $Z$ ) was farmer agency which was represented by asset-based indicators:  $Z$  was the composite of the five assets,  $Z_1$  was human capital assets,  $Z_2$  was material assets,  $Z_3$  was financial assets,  $Z_4$  was organizational assets and  $Z_5$  was psychological assets. The above moderated multiple regression was performed for each of the five indicators of asset-based agency.

The significance of the slope of the regression line was given by the  $t$ -statistic and the regression model had predictive value only if its slope was significantly different than zero. The coefficient of determination ( $r^2$ ) was the proportion of variance in the dependent variable accounted for by the regression equation. The Variance Inflation Factor (VIF) was used to test for multicollinearity among the independent variables.

## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents the results and findings of the three objectives. The study sought to analyze the relationship between Producer Institutional Arrangements in the coffee sector and their effect on economic benefits to farmers. The study used various statistical tools and approaches to analyze and present the data. Tests of assumptions were performed to test the assumption of normal distribution of the data, linearity and multi-collinearity. Qualitative analysis was used to accomplish the first objective while quantitative analysis was used for the second and third objective. In the first objective of characterizing the Producer Institutional Arrangements, open and thematic coding and commodity chain analysis were used to analyze responses to open-ended questions. Multiple regression was used to accomplish the second objective of determining the relationship between the institutional framework and economic benefits to farmers in the three institutional arrangements. Moderated multiple regression was used to achieve the third objective of establishing the extent to which farmer agency moderated the relationship between the institutional framework and economic benefits to farmers.

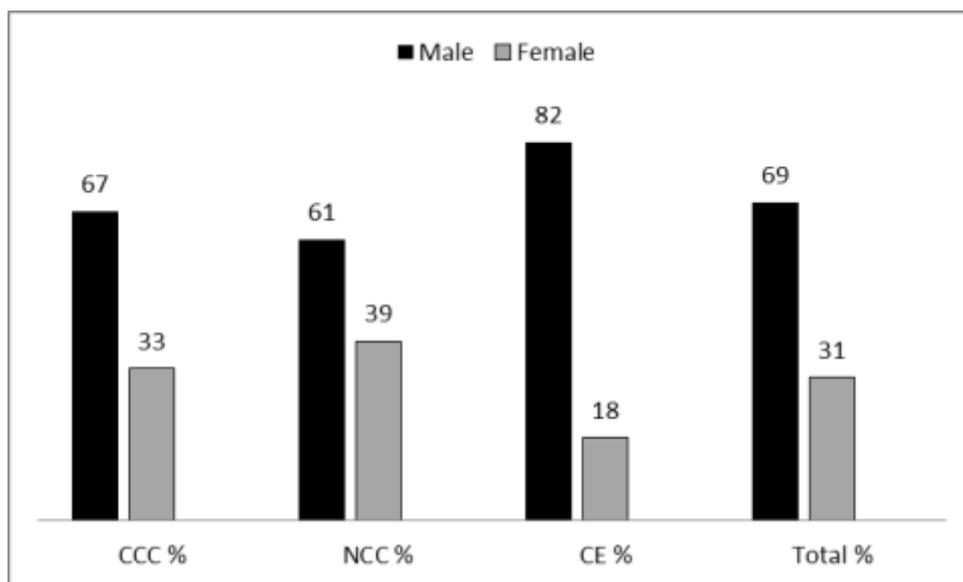
#### **4.2 Characterization of Producer Institutional Arrangements**

In order to characterize the Producer Institutional Arrangements the following was undertaken: a description was made of the sample characteristics, a profile of the Producer Institutional Arrangements was given and a commentary made on the actors and processes in the coffee commodity chain. The objective of characterizing the Producer Institutional Arrangements was to enable a comparison of the three arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates. This provided a context for analyzing the relationship between the institutional framework of these three institutional arrangements and the economic

benefits attained by the coffee farmers engage in them. Characterizing the Producer Institutional Arrangements also served as a reference in the policy and practice recommendations as well as in identifying areas of further study.

#### 4.2.1 Sample Characteristics

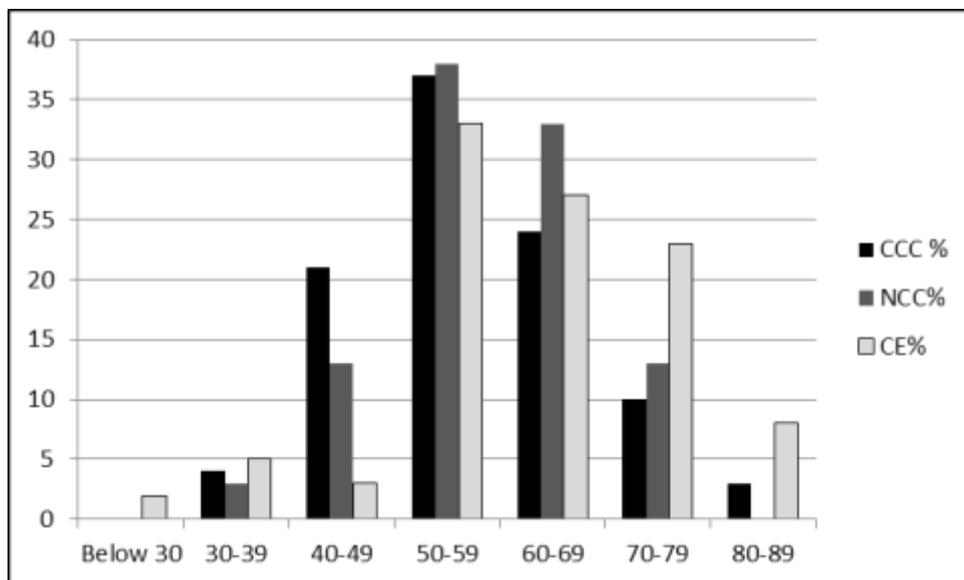
This section presents the sample characteristics of respondents in terms of gender, age and education. There were 260 respondents out of the targeted sample of 384, which represented a response rate of 68 per cent. According to Saunders and Lewis (2012), a 60 per cent respondent rate is acceptable. This enables a generalization of the findings to the population.



**Figure 4.1 Gender of Respondents**

In all the institutional arrangements, males were the majority. The lower percentages of male farmers in the cooperative sector as compared to estates can be partially attributed to the fact that some factory managers chose to be proactive in ensuring gender representation of respondents. Land is predominantly owned by men and this translates to ownership of the coffee farms. However, one coffee cooperative had taken measures to ensure that women were effectively engaged in coffee production.

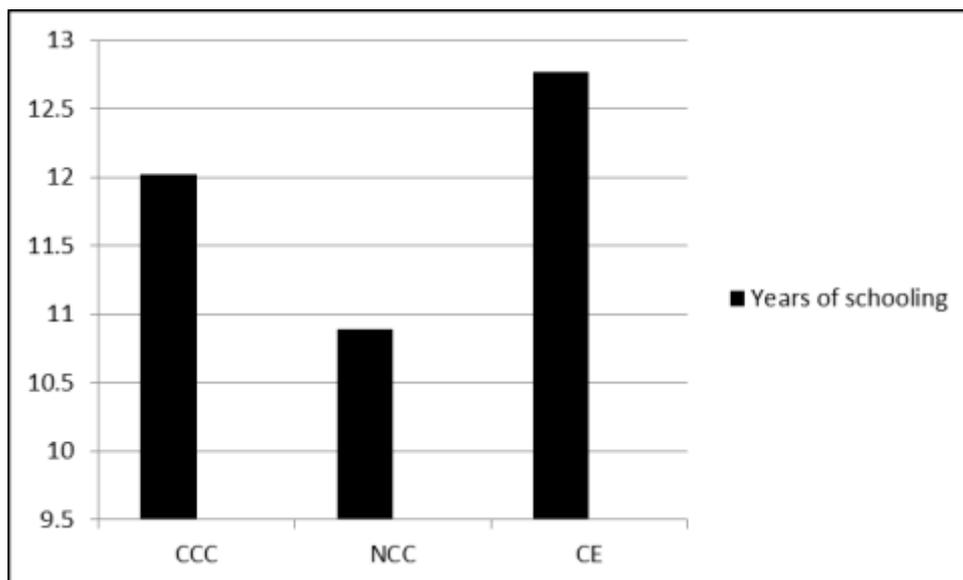
This was done through conducting trainings specifically geared towards women, where they are taught various aspects of coffee production and farm management. Other cooperatives took measures to ensure a gender balance in the cooperative management committee, whereby if there was no woman elected in the committee, one would be nominated. This however was dependent on the by-laws of particular cooperatives as it was not a requirement stipulated in the Cooperative Act that regulates the cooperative industry. Regarding management employees, only three of the 23 cooperative had a female secretary-manager at the time of the study.



**Figure 4.2 Age of Respondents**

There was only one farmer below 30 while the 30-39 age group averaged four per cent across all groups. However in the 40-49 age group, estates were comparatively lower with three per cent compared to 21 and 13 per cent respectively for the Certified and Non-Certified Cooperatives. The 50-59 age groups were all close to the average of 36 per cent while the 60-69 age groups ranged from 24-33 per cent. The 70-79 age groups registered a higher percentage among Coffee Estates with 37 per cent of respondents being in this category compared to 10 and 13 per cent respectively in the Certified and Non-Certified Cooperatives. Overall, the majority of

respondents were between the 50-69 age group, with more than 60 per cent being in this category. Key informants explained that the dominance of the older generation could be attributed to small farm sizes that did not lend themselves to division as well as a disinterest in coffee farming among the youth. This fits in with the literature review which cites a paucity of youth in coffee farming in Kenya.



**Figure 4.3 Education of Respondents**

In both cooperative groups, the lowest number of years of schooling was four years while in estates the lowest was two years. The highest number of years of schooling for respondents from Certified Coffee Cooperatives was 20 years while in the Non-certified Coffee Cooperatives and Coffee Estates it was 18 years. The mean number for years of schooling was 12, 11 and 13 years for the Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estate respondents respectively.

#### **4.2.2 Profiles of the Producer Institutional Arrangements**

This section profiles the three Producer Institutional Arrangements in the coffee sector in Kenya. The coffee industry in Kenya is regulated by the Coffee Directorate. It is part of the Agriculture, Fisheries and Food Authority (AFFA) which was created

by the Agriculture, Fisheries and Food Authority Act (No. 13 of 2013). AFFA stipulates that coffee farmers with less than two hectares (five acres) should engage in production as part of a cooperative while those with more have the option of production outside cooperative membership. This differentiation is detailed in its definitions of a smallholder coffee farmer and a coffee estate. A smallholder is defined as “a farmer of coffee in a small parcel or in small parcels of land who does not possess his own pulping station and shall register with a cooperative society” while a coffee estate is defined as “any large area of land or group of parcels of land under the same ownership on which coffee is grown and shall be not less than two hectares” (AFFA, 2013).

Although Coffee Estates have the option of being cooperative members, the operational definition of ‘coffee estate’ in this study refers to those outside cooperative membership. Coffee cooperative societies in Kenya are constituted, registered and regulated by the Co-operative Societies Act, Chapter 490 of the Constitution of Kenya (2010). Cooperative societies also formulate by-laws to govern various aspects of the administration of the cooperative. A major distinguishing factor between cooperatives is whether they produce coffee under a certification scheme. The AFFA defines coffee certification as, “a system that distinguishes a coffee product as being sustainably grown on the basis of economic viability, environmental conservation, social responsibility and ensures traceability.” (2015). While some certification schemes can involve Coffee Estates, it is not the norm for estates to be certified. On the basis of these definitions and differentiations, the coffee sector in Kenya has three major Producer Institutional Arrangements. These are Coffee Estates, Certified Coffee Cooperatives and Non-certified Coffee Cooperatives.

#### a. Profile of Coffee Cooperatives

The history of coffee cooperatives in Kenya dates to the mid-1950s when the first cooperatives were formed. The Cooperative Societies Act details the procedure of cooperative formation and management. The Act is divided into 15 parts: Part I- Preliminary, Part II – Officers, Part III – Registration of Cooperative Societies, Part IV – Privileges of a Registered Society, Part V – Rights and Liabilities of Members,

Part VI – Duties of Cooperative Societies, Part VII – Management of Cooperative Societies, Part VIII – Amalgamation and Division of Cooperative Societies, Part IX – Rights and Obligations of Cooperative Societies, Part X – Property and Funds of Cooperative Societies, Part XI – Inquiry and Inspection, Part XII – Dissolution, Part XIII – Surcharge, Part XIV – Settlement of Disputes, Part XV – General (RoK, 2012).

Of particular interest to this study is Part V which details the rights and liabilities of members. These include the voting rights of members which states that each member shall have one vote only in the affairs of the society irrespective of the number of shares held. Other rights include the right to: attend and participate in decisions taken at all general meetings of the society and vote, be elected to organs of the society subject to its by-laws, enjoy the use of all facilities and services of the society subject to the society's by-laws and have the right to all legitimate information in relation to the society including internal regulations, registers, minutes of general meetings, supervisory committee reports, annual accounts, inventories and investment reports. Limitations of cooperative members include: no member shall hold more than one-fifth of the issued and paid-up share capital of any cooperative society, no person shall be a member of more than one cooperative society with unlimited liability and no person shall be a member of more than one cooperative society having the same or similar object.

Until the late 1980s and early 1990s, there were four farmer cooperative societies (FCS) in the coffee sector in Nyeri County. Commonly referred to as the 'giant' cooperatives and named according to their locale, they comprised of Othaya FCS, Tetu FCS, Mathira FCS and Mukurweini FCS. During the period of economic liberalization that spanned the late 80s and 90s however, the government partially disengaged from the coffee sector and allowed the proliferation of other actors in the coffee chain. Coupled with political influences, economic liberalization led to the splitting of the 'giant' cooperatives into smaller cooperatives. Of the four initial cooperatives, only Othaya FCS did not undergo a split while the other three split into mostly one-factory cooperatives. In the late 1990s, a directive was given to merge the

factories of the newly formed cooperatives to enable economic viability. This happened to a large extent among the coffee cooperatives in Mukurweini and Mathira but not in Tetu. Table 4.1 depicts the former ‘giant’ cooperatives, the current cooperatives formed from them, the number of factories under each and whether they cooperative is certified or not.

**Table 4.1 Coffee Cooperatives in Nyeri County**

Former FCS	Current Cooperatives	No. of Factories
Othaya	Othaya	19
Tetu	Mutheka	6
	Thiriku	1
	Gathaithi	1
	Aguthi	4
	Wachuri	1
	Gachatha	1
	Giakanja	1
	Githiru	1
	Njuriga	1
	Mukurweini	Rugi
Rumukia		8
New Gikaru		5
Ruthaka		4
Mathira	Mathira North	5
	Rutuma	7
	Kiama	5
	Tekangu	4
	Mugaga	5
	Iria-ini	3
	Gikanda	3

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Barichu	4
Gakuyu	2

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Survey data, 2017

Othaya FCS has retained its name and its original 19 factories. The former Mukurweini FCS is comprised of four cooperatives, which are a result of the merging of the several cooperatives that resulted from the split. The former Mathira FCS comprises nine cooperatives which are also the result of the merger of cooperatives formed after the split. The former Tetu FCS has nine cooperatives of which seven are single-factory cooperatives, and is the only area that features single-factory cooperatives. The non-splitting of Othaya FCS and the failure to merge of the single-factory cooperatives in Tetu has been attributed mainly to politics. Although economic viability is expected in the larger cooperatives with more factories, there are single-factory cooperatives that performed well in terms of the payout price and the quality of their coffee. In Nyeri county, there were three cooperatives with their own mill; Othaya, Rumukia and Gikanda, while three cooperatives roasted their coffee; Othaya, Gikanda and Barichu. These were all certified cooperatives. Othaya had a roasting facility while Barichu and Gikanda outsourced this service. None of the three had however begun marketing through retail outlets although Othaya FCS was selling to hotels and Barichu FCS operated a café which served their packaged and brewed coffee.

In cooperatives, management is by a committee that is elected by farmers and the Cooperative Act in Part VII outlines their duties. It states that the committee shall be the governing body of the society and shall, subject to any direction from a general meeting of the by-laws of the cooperative society, direct the affairs of the society with power to enter into contracts, institute and defend suits and other legal proceedings brought in the name of or against the society and do all other things

necessary to achieve the society's objects in accordance with its by-laws (Republic of Kenya, 2012). The cooperative management committee is composed of representatives elected at the factory level. The secretary-manager of the cooperative is an employee and is part of the administration. Factory managers oversee the technical aspects of the factory operations but in one-factory cooperatives, they usually function in the capacity of a secretary-manager. According to information given by key informants from cooperatives, certification among the coffee cooperatives began around 2006. Certification was engaged in primarily as a means of receiving higher pay as it was viewed as being an advantage in the marketing process. In Nyeri County, fourteen of the cooperatives had certification while nine did not.

**Table 4.2 Certified Coffee Cooperatives and Non-certified Coffee Cooperatives**

Certified Coffee Cooperatives		Non-certified Cooperatives	
Former FCS	Current Cooperative	Former FCS	Current Cooperative
Othaya	Othaya	Tetu	Aguthi
Tetu	Mutheka	Tetu	Wachuri
Tetu	Thiriku	Tetu	Gachatha
Tetu	Gathaiti	Tetu	Giakanja
Mukurweini	Rugi	Tetu	Githiru
Mukurweini	Rumukia	Tetu	Njuriga
Mukurweini	New Gikaru	Mathira	Mathira North
Mukurweini	Ruthaka	Mathira	Rutuma
Mathira	Tekangu	Mathira	Kiama
Mathira	Mugaga		
Mathira	Iria-ini		
Mathira	Gikanda		
Mathira	Barichu		
Mathira	Gakuyu		
TOTAL	14	TOTAL	9

Survey data, 2017

As depicted in Table 4.2, Othaya FCS and all four cooperatives in the former Mukurweini were certified. Six of the nine cooperatives in the former Mathira FCS were certified while three of the nine in the former Tetu FCS were certified. In total 14 cooperatives were certified while nine cooperatives were non-certified. Information on the membership of these cooperatives is depicted in the table below.

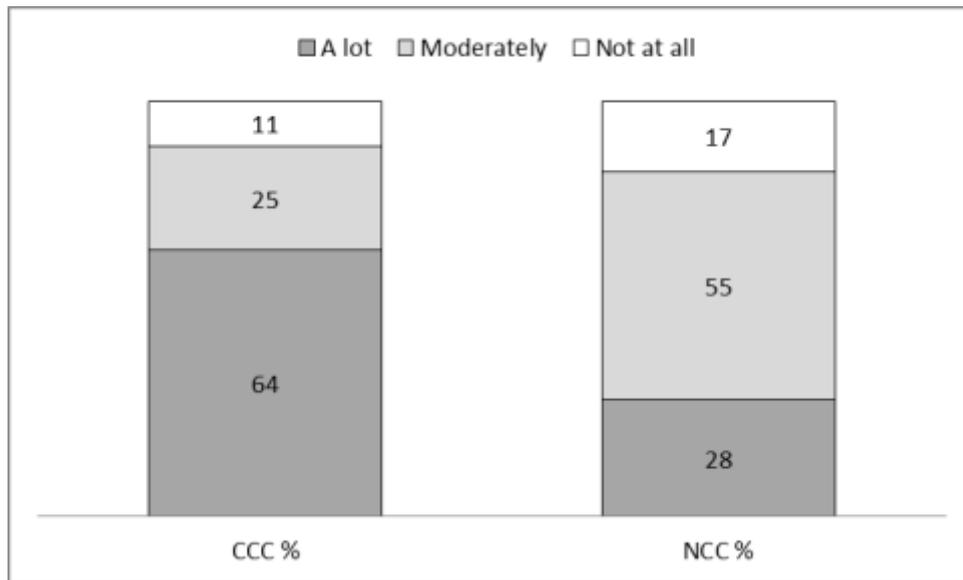
**Table 4.3 Coffee Cooperative Membership**

Certified	Non-certified
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	<b>Coffee Cooperatives</b>	<b>Coffee Cooperatives</b>
<b>Registered members</b>		
Lowest	1430	400
Highest	15000	6883
Mean	5084	2933
Std. Deviation	3823	2300
<b>Active members</b>		
Lowest	1137	280
Highest	7322	4460
Mean	4031	1901
Std. Deviation	2105	1386

Survey data, 2017

Seventeen of the 23 cooperatives provided data the number of registered members while the rest provided data on the number of active members. Active membership was markedly less than the registered membership. The highest number of active members among the Certified Coffee Cooperatives was less than half of the registered membership, depicting a large number of dormant farmers. The cooperative with the least number of active members was a Non-certified Coffee Cooperative with 280 active members. Members of Certified and Non-Certified Cooperatives had differing levels of perceived benefits. When asked whether they benefitted a lot, moderately or not at all from being cooperative members, the response showed that a higher number of members of certified cooperative perceived that they benefitted a lot compared to those from the Non-certified Cooperatives.



**Figure 4.4 Benefit from Cooperative Membership**

Over 60 per cent of those from the Certified Cooperatives indicated that they benefitted a lot compared to less than 30 per cent of those from the Non-Certified Cooperatives. Cooperative respondents who indicated that they benefitted a lot gave several reasons. Financial reasons included a revolving fund in some cooperatives and increased bargaining power across the chain. Respondents also stated that having shares in the cooperative gave them ‘a voice’ regardless of their number of coffee trees. This was especially the case in cooperatives that respondents considered transparent with open channels of communication. It was also asserted that the cooperative system was beneficial for the basic reason that humans were social animals. It was however reiterated that benefitting from a cooperative also depended on individual effort as payment was dependent on the production level. Those who stated that they benefitted moderately or not all indicated that ineffective management could divert gains. Low coffee prices were also cited as a reason for not benefitting from the cooperative. The alternative to cooperative membership for small farmers was seen to be cherry hawking which did not fetch much money.

i. Certification in the Producer Institutional Arrangements

The most common certification identified in this study was that of Fairtrade, with at least twelve of the twenty-three cooperatives having received Fairtrade certification. This certification was current in some cooperatives but had expired in others. The earliest Fairtrade certification indicated was from 2006. At least seven cooperatives had obtained RainForest Alliance certification and four had acquired 4C certification with one stating that it was dormant at the time. Two stated they had in the past been UTZ certified.

Key informants from Non-Certified Cooperatives stated that they were considering certification or were in the process of acquiring certification, while some had previously tried and failed to obtain certification. One cooperative had attempted to be FairTrade and Rainforest Alliance certified but had not met certain requirements such as those of quality, while another had failed in its attempt to be certified under Café Practices. The cost of certification was mentioned as a hindrance, due to requirements such as ensuring protective equipment for farmers and stipulated wage requirements for casual labour. One cooperative was working in collaboration with the marketer who would meet half of the one million cost of certification.

In the case of certification of estates, it was stated that there were organizations that would offer assistance such as information provision and availing of an agronomist. The cost of certification was however still unaffordable for most individual estates. Respondents also explained that it was difficult for estates to collaborate on attaining certification due to varying financial levels, as well as renegeing on agreement on joint milling by going to alternative millers who offered an advance or other resources required urgently at the time. Only one estate indicated they had received certification.

#### ii. Requirements of Coffee Certification

Regarding the requirements for certification, key informants indicated that they comprised of labour, quality and environmental standards. Labour standards included interactions between the administration and employees as well as labourers, upholding of human rights and democracy, non-use of child labour, spouse benefitting from coffee payments if involved in coffee production and a proper flow of information with traceability of transactions and documentation. Quality standards

encompassed the entire coffee production and processing chain with millers, marketers and buyers also requiring certification. Environmental standards included environmental management throughout the coffee processing chain starting from the farm. This included practices such as proper hygiene, access to clean drinking water, toilets in home or farm area, proper disposal of waste matter, no leakage of water from sewage pits, proper storage of chemicals and non-use of prohibited chemicals. Audits were carried out to ensure compliance so as to maintain certification.

### iii. Benefits of Coffee Certification

In terms of benefits of certification, at least six key informants mentioned premiums as being one of the benefits of certification. It was acknowledged that although premiums did not go directly to the farmer, they lifted the standard of living in the community. This was through support of health, education or security projects. Other benefits of certification cited included access to a wider market, higher prices, faster marketing, an added advantage in Direct Sales, training of farmers, requirement of fair payment of wages and salaries to employees, provision of appropriate clothing and equipment, enhanced capacity of employees in negotiation and a conducive factory environment including the observation of occupational health and safety standards.

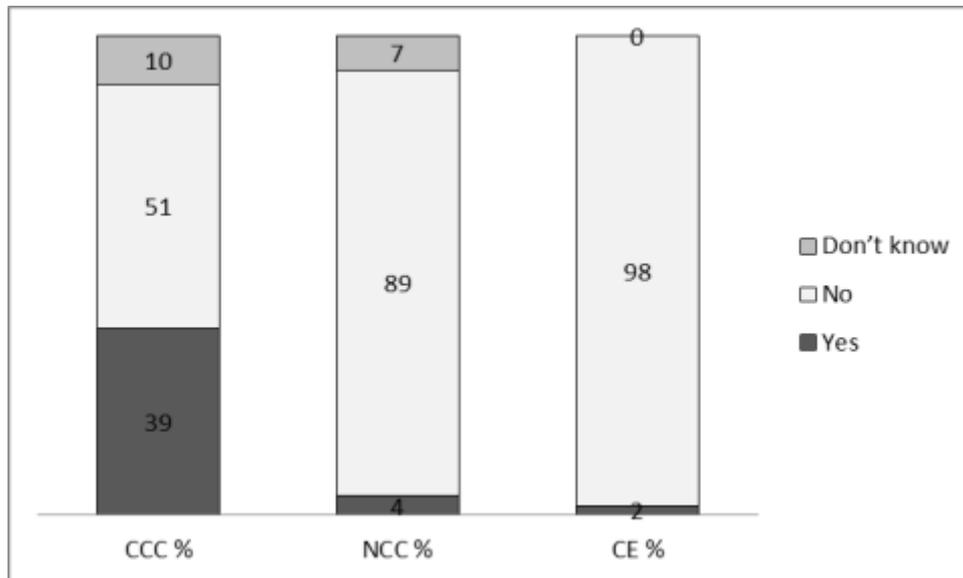
Measures taken to obtain certification were also said to improve the quantity and quality of coffee, as well as the environment. There are key informants who however stated that there were no benefits to certification as they had not received premiums or had received them inconsistently. Among the certified respondents, there are some who did not understand the certification process or were partially informed and were therefore unsure of the benefits of certification. Benefits of certification were also viewed as being dependent on the cooperative management in place. It was stated that cooperative management could put measures in place to ensure that the cooperative met the requirements of certification, particularly as pertained to the enforcement of good agricultural practices (GAP) which would ensure high quality coffee and increased production. The high quality of coffee was deemed instrumental in receiving a higher price while the increased production would enable the cooperative meet the minimum required quantity that was stipulated by some buyers.

#### iv. Challenges of Coffee Certification

In terms of the challenges of certification, the most frequently mentioned challenge was the difficulty of maintaining certification as it was involving and expensive. Examples of the cost of certification and renewal included an estimated sh.400,000 annually with additional costs of up to sh.1 million. Another example was a cooperative with two certifications stated that cost about sh.350,000 each, while another estimated sh.495,000 plus 100 Euros for an annual audit. This was compared to the amount received in premiums with one cooperative giving the example of having received a total of sh.300,000 in three years. Enforcing requirements as well as non-conformity to requirements could also be costly. Key informants explained that farmers required consistent monitoring so as to maintain standards and avoid violation of certification through practices such as poor waste water management, improper chemical handling, farming by the river bank and animal hunting.

Another challenge mentioned was that the certification organizations did not source for markets and the cooperatives therefore had to follow the conventional marketing channels which some deemed as not being transparent. It was also indicated by some that there was no difference in the selling price of coffee between Certified and Non-Certified Cooperatives. It was explained that this was due to factors such as both quality and quantity being required. If the required quantity was not attained, it necessitated the mixing of high and low quality coffee which resulted in lower prices. A challenge which was specific to one cooperative involved the misappropriation of the premium by the cooperative management. This was settled with the help of the District Cooperative Officer and resulted in the management being dissolved and paying back the misappropriated money. The final challenge mentioned was the requirement of multiple actors in the coffee chain being certified. Discontinuation or suspension of certification could occur for various reasons. Some certifications expired and were not renewed due to lack of finances while others were discontinued due to changing the marketer either voluntarily or because of the county directive of central milling and marketing. One key informant also narrated that their marketer had been suspended due to mixing premiums and payments. Lack of

awareness regarding certification by respondents from cooperatives that were certified was another challenge and this is depicted in Figure 4.5.



**Figure 4.5 Awareness of Coffee Certification**

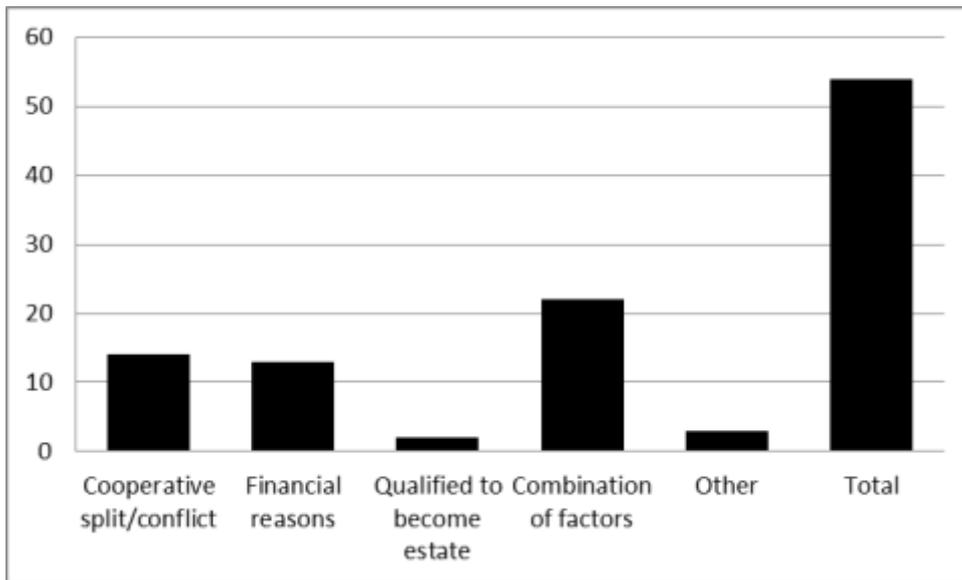
Only 39 per cent of cooperative respondents from Certified Cooperatives indicated that their coffee was produced under a certification label. More than 60 per cent were therefore not aware that their coffee was certified or did not understand the concept of certification. Some also knew they were certified but did not know which certification they had. This was often the case in cooperatives that had obtained different certifications at varying times. There were varying perceptions and levels of awareness on certification among respondents from the Non-certified Cooperatives. Four per cent mistakenly thought their coffee was certified due to reasons such as being encouraged to plant improved varieties of coffee. Those who were aware that their coffee was not certified gave various explanations for this. This included high costs, the cooperative failing to pay the certification fee, conflict in the cooperative and political interference. Others however stated that the cooperative was in the process of acquiring certification. There are those who perceived certification as an

additional burden to the challenges already faced and stated that there were more pressing concerns to contend with besides certification.

There was also the perception of certification being exploitative and of the conventional marketing system not being transparent, whether it involved certified coffee or not. It was also argued that price was majorly dependent on quality and the benefits of certification were therefore difficult to ascertain in terms of marketing and price benefits. Some respondents were however not familiar with the concept of certification and stated that they required more insight into the certification process. Among the estate respondents, some were considering certification and had initiated measures towards this, such as embarking on organic farming. These efforts were being made as part of an association of Coffee Estates and not individually. Others however did not perceive the need for certification, stating that the market was controlled by demand and supply and certification did not have a significant role in these dynamics.

#### **b. Profile of Coffee Estates**

The coffee sector in Kenya was dominated by estates during the colonial period and in Nyeri County, the majority of these estates were in the Nyeri Central area. There are therefore coffee farmers who owned Coffee Estates prior to the formation of cooperatives. A majority of coffee estate owners today were however once members of cooperatives, with 83 per cent of respondents from Coffee Estates indicating they had been cooperative members. Various reasons were given for the decision to move from cooperative to estate farming and these are depicted in the table below.



**Figure 4.6 Factors that Informed Decision to Move from Cooperative to Estate**

The split of cooperatives and the ensuing conflict was cited as a major reason as depicted in Figure 4.6. This was also evident in the lower number of Coffee Estates in Othaya compared to the other areas. Respondents who cited financial reasons explained that they moved to estate farming as they perceived that there were higher profits. Those who moved because they qualified to be estates represent the respondents who were not qualified to operate as an estate until the requirements were lowered from ten to five acres. Only three in the Certified Coffee Cooperatives were reported to have left the cooperative since liberalization with two moving within the last three years. This information was furnished by informants from eight of the fourteen Certified Coffee Cooperatives. Among the Non-certified Coffee Cooperatives, four were reported to have changed to estate farming since liberalization but none had done so within the last three years. Reasons given for this included constraints such as small land size and lack of financial capacity. Estates are managed by the owner and in some instances by a farm manager.

### **4.2.3 Actors and Processes in the Coffee Commodity Chain**

The coffee commodity chain in Kenya comprises of various processes and actors that revolve around the activities of crop production, pulping, milling, marketing and management. The AFFA has the mandate of registering and licensing the actors engaged in these processes. The main activity that coffee farmers engage in is crop production. This involves weeding, pruning, spraying chemicals, applying fertilizer and picking ripe cherry. The major expenses of crop production are the cost of inputs and picking labour. While subsidized fertilizer was availed to farmers, chemical inputs such as pesticides, herbicides and fungicides were not, although a list of approved agro-chemical suppliers was availed. Farmers reported that agro-chemicals were expensive in the context of payment received for coffee. Some respondents therefore stated that they not apply the agro-chemicals in the required amount and frequency. Trainings on coffee husbandry were often carried out by the government agricultural extension officers in cooperatives and to a lesser extent in estates. Agronomist services were however utilized by both certified and non-certified cooperatives as well as estates, with some cooperatives employing a full-time agronomist. In majority of the cooperatives, farm inspection was done by designated cooperative representatives or employees such as a field committee or the factory manager.

Among the key informants who indicated that farm inspections were carried out in their cooperatives, it was explained that prohibiting of cherry delivery to the factory by those not practicing good agricultural practices (GAP) was rarely instituted. This was due to the low production levels which could be further lowered by such measures. Coffee farmers were however aware of the requirements of GAP and were familiar with the 'coffee calendar' which outlines the husbandry practices and the chemicals to be applied throughout the year. They however explained that they were hesitant to incur costs on labour and inputs due to fluctuating and often low coffee prices. The challenges cited in this activity were the high cost of inputs particularly chemicals, lack of or late arrival of subsidized fertilizer, sub-standard fertilizer and the high cost of picking labour. Farmers across all the institutional arrangements

responded to the high cost of inputs by applying inputs in lower amounts than recommended.

Pulping is the next activity after picking of ripe cherry and involves the sorting, washing and drying of cherry, resulting in what is known as coffee parchment. Parchment is classified according to density as P1, P2, P3 and lights, while parchment resulting from cherry that is not washed (dry processed) is referred to as *buni*. Pulping is done at the factory, also referred to as the pulping station particularly in estates. Most estates have one pulping station while the number of factories in a cooperative depends on the number of members. In the coffee cooperatives in Nyeri County, the number of factories in a cooperative ranged from one to nineteen factories. The major costs of pulping are electricity and water, including the pumping of water from source if necessary.

During periods of low production some factories operate as collection centers to save on expenses. Estates mitigate these expenses by delivering cherry to cooperatives when production is low and pulping would not be cost effective. At the factory level, there was no differentiation of farmers based on adherence to GAP or the quality of coffee delivered. Cherry delivered was recorded based on weight alone, which was a disincentive to those farmers who had engaged in GAP. The process of pulping cherry and drying it results in parchment.

Parchment is processed through milling, a process that involves removing (hulling) the outer layer known as the husk. This process results in clean coffee, also referred to as green coffee, which is the form in which almost all coffee from Kenya is exported. The difference in weight between the parchment and the clean coffee is referred to as the milling loss and is expressed as a percentage. Grading of coffee also occurs in this process, where coffee is categorized according to the bean size. The larger sizes constitute premium grades, which command higher prices. Commercial millers are utilized by both cooperatives and estates.

The challenges cited in the milling process were exaggerated milling losses and the swapping of coffee. Coffee swapping was whereby high quality coffee could be exchanged for that of lower quality, which resulted in lowered prices to the farmers. The occurrence of these practices was reported by respondents and key informants

among all three Producer Institutional Arrangements. In cooperatives where the miller was elected by farmers, respondents also reported that bribery of farmers by millers was commonplace. There was therefore the impression that exaggerated milling losses and coffee swapping could partially be caused by an attempt to recover money spent on 'election campaigns.' These challenges were mitigated by some cooperatives and estates through independent verification of the coffee grade and class. Clean coffee is delivered to the marketing agent.

Marketing agents sell coffee either through the auction at the Nairobi Coffee Exchange or through Direct Sales, whereby the sales transaction occurs between the buyer and the cooperative or estate through the marketing agent. Key informants explained that marketing through Direct Sales had the advantage of higher prices although the duration before payment was longer than in auction sales. Marketing agents were widely used by cooperatives and estates, although they could acquire a grower-marketer license to enable them act in the capacity of a marketing agent. This however is not the norm and virtually all cooperatives and estates utilize a marketing agent. While marketers and millers are mandated to be separate entities, the standard practice is to use the marketing agent affiliated with the miller used. With the exception of the cooperatives who had their own mill, virtually all cooperatives and estates used the marketer affiliated with the miller.

Among the few key informants and estate owners who reported having used marketers not affiliated to the miller, it was reported that blame games occurred between the millers and marketer regarding the price of coffee, whereby millers blamed the marketer citing poor marketing while the marketer argued that the coffee delivered was of a low grade or class. While most coffee in Kenya is exported as green coffee, a small proportion is sold domestically and this necessitates the roasting, grinding and packaging of coffee. The major challenges articulated by the farmers in marketing were unpredictable prices which led to farmers reducing inputs as a means of risk aversion, low payments that led to a lack of interest in farming, particularly among the youth and a lack of transparency and accountability. Lack of transparency involved a lack of detailed and timely documentation, limited

knowledge on the marketing process and perceived collusion between the miller and marketer and between the marketer and the dealers in the auction.

In the above processes of the coffee chain, there was collaboration among the cooperatives in some of the activities. Key informants from ten certified cooperatives and seven non-certified cooperatives indicated that their cooperatives were engaged in collaboration with other cooperatives. Activities done in collaboration with other cooperatives included information sharing, trainings and tendering for some inputs. Seven key informants from certified cooperatives and three from non-certified cooperatives indicated that their cooperatives collaborated with other organizations or individuals engaged in the coffee chain such as non-governmental organizations, coffee consultants, farmer organization groups and coffee processors. Collaboration included activities such as trainings, good agricultural practices, acquisition of inputs, coffee quality assurance and the certification process. It was explained that most collaborations were usually not on a long-term basis. Among the certified cooperatives, it was explained that collaboration was often involved in the process of acquiring and maintaining certification.

Among the coffee estate respondents, 46 per cent indicated that they had collaborated with other estates in the production and marketing of coffee. Only two per cent, representing one of 54 estates indicated that they had collaborated or partnered with other organizations or individuals, other than estates, in coffee production or marketing. It was explained that while there was more bargaining power in collaborations, estates were hesitant of joint ventures. This was due to fear that the process would lend itself to the same corruption as cooperatives, being skeptical of the benefits of collaboration and collaborative marketing requiring a lot of capacity building.

The findings of the study revealed various ways in which there was a lack of farmer empowerment in terms of the desired outcome of achieving economic benefits, across all the institutional arrangements. The definition of empowerment adopted in this study was ‘a group’s or individual’s capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes (Alsop, Bertelsen & Holland, 2006:10). Degrees of empowerment can be

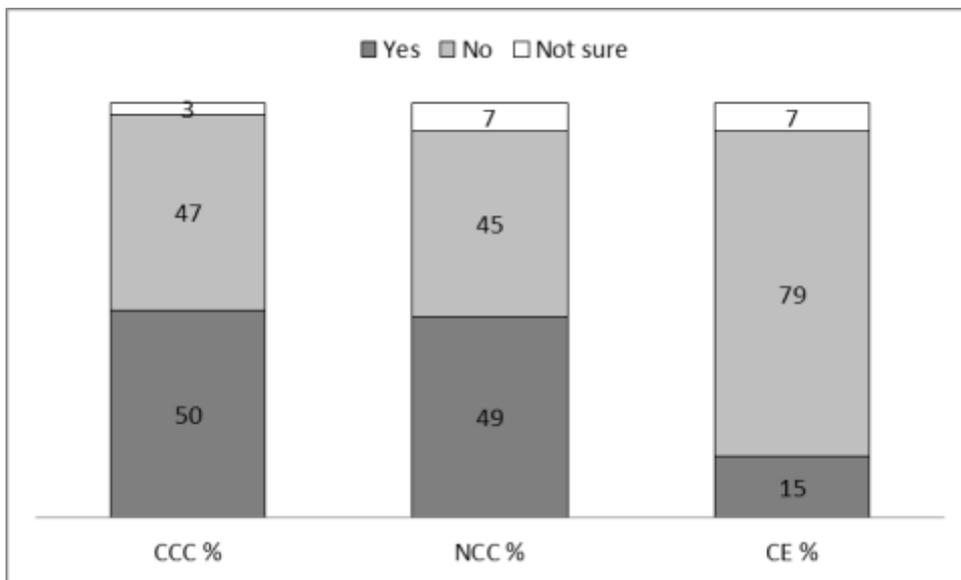
measured by a three-step assessment which takes into account the existence of choice, the use of choice and the achievement of choice, which is the achievement of the desired outcome (Alsop & Heinsohn, 2005). In this study, the desired outcome for coffee farmers is economic benefits as farmers engage in coffee production as economic activity.

A lack of empowerment was in instances where choices were available but not accessible, or were accessible but resulted in no benefit. At the farm level, this lack of empowerment was noted in several instances. One was whereby farmers had knowledge of good agricultural practices (GAP) but did not practice these as they could not afford the costs of the inputs and labour required. Another instance was when there was access to and use of inputs but no benefit in practicing GAP due to lack of quality differentiation at the farm and factory level, leading to the same payout rate for all farmers regardless of their level of practicing GAP. A third instance was where farmers had access to credit but on detrimental terms in regards to interest rates and the repayment period. A fourth instance was whereby farmers had access to subsidized fertilizers but these were not availed on time or were reportedly sub-standard, and were therefore not effective in increasing the quantity or improving the quality of coffee.

At the cooperative level these included farmers having the right to attend meetings but being unable to participate effectively due to intimidation and having the right to vote for management but being unable to hold them accountable in terms of recovering misappropriated money. At the milling and marketing level, these instances included: the opportunity to vote for the miller but in a process lacking transparency and accountability, the legal but not practical separation of the miller and marketer, availability and access to the process of verifying the coffee grade and class but lacking an avenue to address discrepancies found, availability and access to means of improving quality of coffee but not receiving expected gains due to misappropriation of money and availability of the option of Direct Sales which had higher prices but waiting a longer duration to receive payment.

It was also noted that the opportunity to engage with coffee chain players could be available but farmers could be ill-equipped for such engagement due to lack of the

necessary information and knowledge and differential power relations. Additionally, they could also lack the means of holding the coffee chain actors accountable due to lack of legal or financial means. There were also instances where farmers had access to information on the coffee industry but were unable to understand it or were unsure if the information was correct. Additionally, the cooperative ideal which was meant to offer benefits such as sharing of expenses also meant that coffee quality was also ‘shared’ as there was no differentiation at the farm or factory level. Respondents from all three Producer Institutional Arrangements were asked if they would consider opting out of their current arrangement if they had the opportunity. Their responses are detailed in Figure 4.7.



**Figure 4.7 Consideration of Opting Out of Producer Institutional Arrangement**

On the question of whether the respondents from cooperatives would consider opting out of cooperative membership to engage in estate farming if they met the requirements, Figure 4.7 shows that about 50 percent from both the certified and Non-certified Coffee Cooperatives indicated that they would do so. Cooperative respondents who stated they would consider leaving the cooperative for estate farming if it were possible gave varying reasons for this. Most responses were based on the perceived advantage that estates had, especially in the marketing process and

control of operational expenses. Among the estate respondents, only 15 per cent indicated that they would consider joining cooperatives. They explained that they would do so if certain conditions were met, such as the cooperative streamlining its processes since good facilities were already in place, and the improvement of management.

In conclusion, characterization of the Producer Institutional Arrangements revealed similarities and differences among them. The sample characteristics showed similarities in the following areas in the three arrangements. There was a higher percentage of males, the majority of farmers were between 50-69 years and the average years of schooling was between 11-13 years. Differences were however evident in that estates had a higher percentage of respondents in the 70-89 age bracket and had much less representation in the 40-49 age group compared to the cooperatives. Estates also had a higher percentage of male respondents at 82 per cent compared to 67 and 61 per cent in the certified and non-certified cooperatives respectively. The cooperative profile revealed that dormant farmers were a feature of both certified and non-certified cooperatives and that about 50 per cent of respondents from both would consider opting out of the cooperative for estate farming if they were able to. A higher percentage of respondents from the certified cooperatives however perceived that they benefitted a lot from being cooperative members compared to their counterparts in the non-certified cooperatives.

Various organizational constraints were noted among cooperatives, both certified and non-certified. These included opportunistic behaviour such as free-riding, cherry hawking, selling by farmers of the subsidized fertilizer received or applying it to other crops, overpriced chemical inputs and bureaucratic inefficiencies exacerbated by a lack of transparency and accountability measures. Producer institutional frameworks determine the availability of choices, access to resources and therefore facilitate or inhibit a farmer's empowerment and benefits derived. The liberalization of the activities and interactions in Kenya's coffee sector availed more choices to farmers by permitting numerous actors in the production, processing and marketing of coffee. These increased options and the dismantling of supposed constraints to the free market, were meant to empower farmers. Farmers however function within

institutional frameworks that encompass market forces, government regulations and unequal power relations with coffee chain actors.

### **4.3 Producer Institutional Framework and Economic Benefits**

The second objective of this study was to determine the relationship between the Producer Institutional Framework and Economic Benefits for the three Producer Institutional Arrangements. This was done through performing multiple regression with the Institutional Framework as the independent variable and Economic Benefits as the dependent variable.

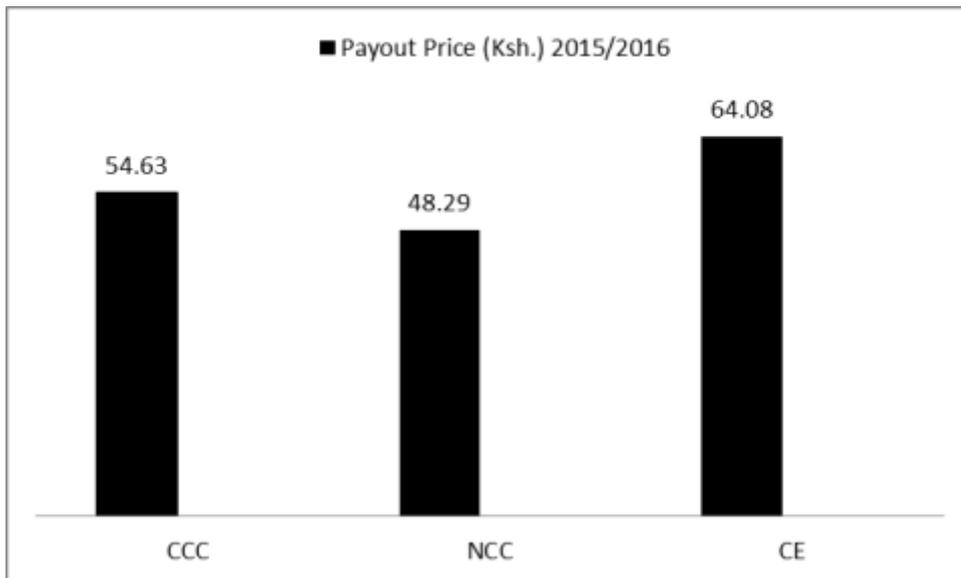
Tests of assumption were performed to ascertain that the data was amenable to tests of multiple regression. A normality diagnostic test was performed to test the distribution of the data, skewness and kurtosis were measured for all the variables. The data was found to be normally distributed as the kurtosis and skewness statistic was within the  $\pm 2$  range which according to George and Mallery (2010) is within normal distribution. A collinearity test was performed to determine whether multicollinearity was present, using tolerance and variance correlation analysis. The test was performed using the independent variables. Based on the cutoff threshold of 5 for the Variance Inflation Factor (Studenmund, 2001) it was concluded that there was no multicollinearity in the variables for all the three Producer Institutional Arrangements. (See Appendix 6 for comprehensive results of the multicollinearity test and the normality diagnostic test).

To test for the assumption of linearity the Breusch-Pagan test was used. The null hypothesis was that there was same variance in the linear regression models. The results were: for the overall model  $\chi^2(5)=2.926$ ,  $p=0.711393$ , for the Certified Coffee Cooperatives  $\chi^2(5)=1.108$ ,  $p=0.953393$ , for the Non-certified Coffee Cooperatives  $\chi^2(5)=1.893$ ,  $p=0.863744$  and for the Coffee Estates  $\chi^2(5)=2.1573$ ,  $p=0.826979$ . The null hypothesis was therefore not rejected in any of the Producer Institutional Arrangements and it was concluded that there was same variance.

To test for reliability the Cronbach Alpha was used as it assesses the reliability of the test items used, that is, whether they are a consistent measure of a concept. The result

of  $\alpha=0.886$  for the overall questionnaire showed strong internal consistency for the overall questionnaire based on the cutoff rate given by Hair et al (2007) of  $\alpha$  of 0.7. The results for the questionnaire sections were  $\alpha=0.554$  for Ability to Choose, Decide and Hold Accountable,  $\alpha=0.732$  for Access to Industry Information and  $\alpha=0.736$  for Access to Productive Inputs. Ability to Negotiate and Access to Health and Education Benefits had a low number of questionnaire items and were therefore not amenable to the test.

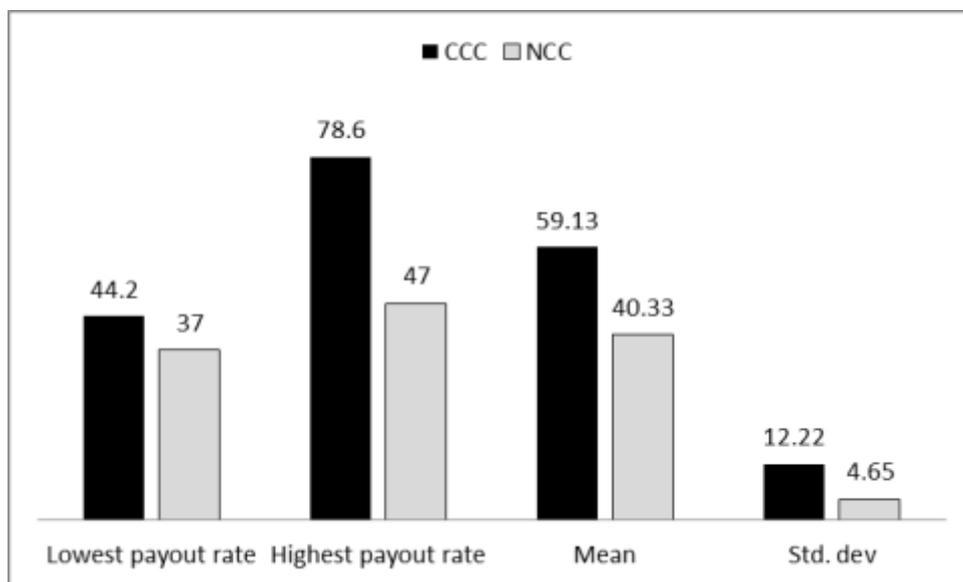
The Institutional Framework which was the independent variable comprised the following: Ability to Choose, Decide and Hold Accountable, Ability to Negotiate, Access to Industry Information, Access to Productive Inputs and Access to Health and Education Benefits. Economic Benefits which was the dependent variable was measured using the 2015/2016 income. This was calculated as the payout rate multiplied by the number of kilograms of cherry.



**Figure 4.8 Payout Price (Ksh) 2015/2016**

In Coffee Estates, the payout rate was given per kilogram of parchment. This was multiplied by seven to convert the weight in parchment to its equivalent weight in cherry. The payout rate attributed to cooperatives was often the average rate of all

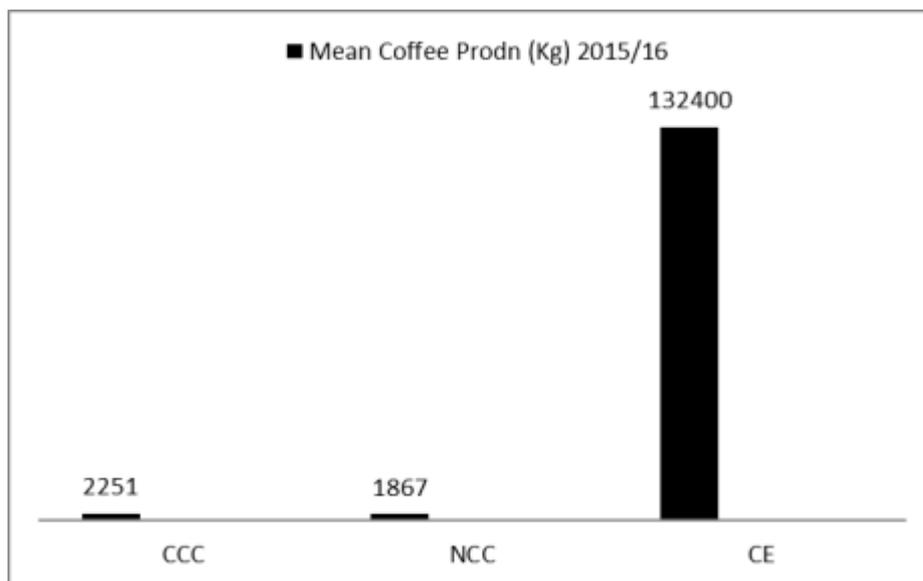
factories. The payout rate however differed between factories within the same cooperative due to differences in operational expenses at the factory level, differences in quality and quantity, use of different millers among the factories and subsequently the use of different marketers. Thirteen key informants from the Certified Coffee Cooperatives and four from the Non-certified Coffee Cooperatives provided information on the payout rate for each of their cooperatives and this information is summarized in Figure 4.9.



**Figure 4.9 Cooperatives Payout Rate (Kshs.) for 2015/2016**

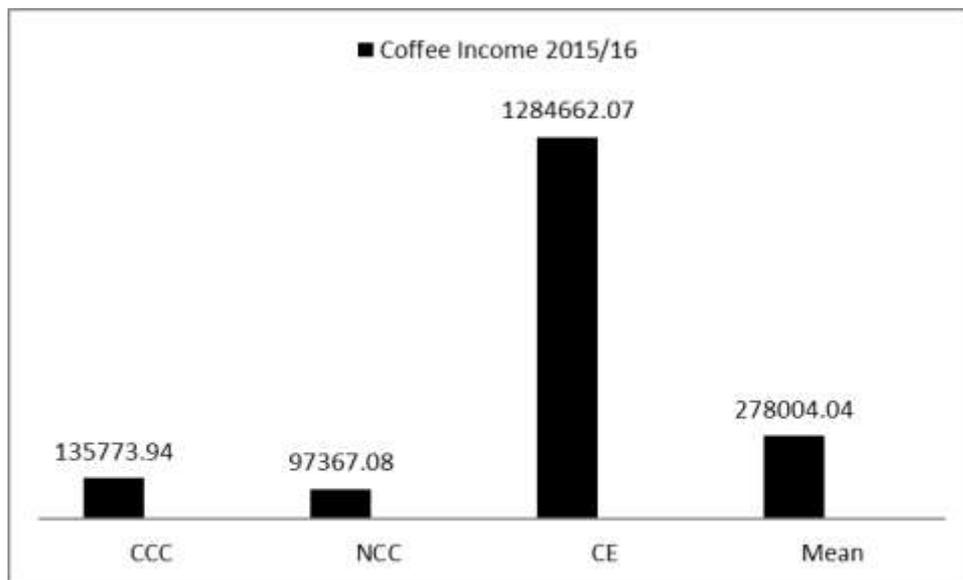
As depicted in Figure 4.9, the Certified Coffee Cooperatives had a higher mean payout rate than the non-certified ones. The certified coffee cooperative that had the lowest payout rate was sh.44.20/kg of cherry which was more than sh.7/kg more than the non-certified cooperatives. This difference in payout rate was more pronounced when comparing the highest payout rate which was close to sh.80 in the certified cooperative and less than sh.50/kg in the non-certified cooperatives. Four Certified Coffee Cooperatives and five non-certified ones also availed information on the payout prices per factory. It was noted that the best paying cooperative was a certified cooperatives and had a payout rate of sh.68.35/kg to the factory paid the

least and a payout rate of sh.81.03/kg to the highest paid one. The cooperative that had the lowest payout rate was a non-certified one and had a payout rate of sh.33.90/kg to the highest paid factory and sh.23.10/kg to the least paid factory.



**Figure 4.10 Mean Coffee Production (Kg) for 2015/2016**

Coffee production differed vastly between the estate and cooperative farmers. While the mean production levels of the Certified Coffee Cooperatives and Non-certified Coffee Cooperatives are representative, the mean coffee production of Coffee Estates is not representative of estate farmers as acreage and number of coffee trees differ greatly amongst coffee estate farmers. Fig 4.10 shows the mean coffee production in kilograms with certified cooperative farmers producing slightly less than 400kg more for the year than non-certified cooperatives. The difference between production by cooperative and estates is however pronounced, with the average production in the estates close to 60 times that of the certified cooperative farmers. This can be attributed to the presence of Coffee Estates that have large acreage and number of coffee trees. The average number of trees was 370 for the certified cooperative farmers, 378 for the non-certified cooperative farmers and 5814 for the Coffee Estates.



**Figure 4.11 Coffee Income (Ksh) for 2015/2016**

The difference in the number of coffee trees and production as well as payout rates translates to a similarly large difference between the income of coffee estate farmers and cooperative farmers. This is depicted in Fig 4.11 that shows that the mean income of Coffee Estates was more than ten times that of non-certified cooperative farmers. The income of certified cooperative farmers was higher than that of non-certified cooperative farmers by Ksh. 38,406.86 for the year.

### **4.3.1 Producer Institutional Framework and Economic Benefits – Overall**

#### **Model**

Multiple regression was performed to determine the relationship between the Institutional Framework and Economic Benefits. This was first done for an overall model which combined the three Producer Institutional Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates. A multiple regression was then done separately for each of the three arrangements. The F-statistic which tests the overall significance of the regression model found that there was a significant regression equation for the overall model as well as for each of the Producer Institutional Arrangements at both the 0.005 and the 0.001 level.

This indicated that the models accounted for significantly more variance in the dependent variable of Economic Benefits than would be expected by chance and the null hypothesis of the F-test, that all the regression coefficients are equal to zero, was therefore rejected. The regression equation for the overall model of all the Producer Institutional Arrangements was  $F(5,205)=25.867$ ,  $p=0.000$ , with an  $R^2$  of 0.387. The overall model was therefore significant and accounted for 38.7 per cent of variance.

**Table 4.4 Producer Institutional Framework and Economic Benefits – Overall Model**

Independent variable	Beta	t-statistic	Significance p-value
<b>Producer Institutional Framework</b>			
Constant		-2.059	0.041
Ability to Choose, Decide and Hold Accountable	0.228	3.549	0.000**
Ability to Negotiate	-0.282	-4.669	0.000**
Access to Industry Information	-0.005	-0.073	0.942
Access to Productive Inputs	-0.330	-4.838	0.000**
Access to Health and Education Benefits	0.325	5.791	0.000**

Key \*\* significant at 5 per cent  
Survey data, 2017

Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs and AHE=Access to Health and Educational Benefits, the regression equation for the Overall model as depicted in Table 4.4 was therefore:

$$EB = - 2.059 + 0.228 ACDH - 0.282 AN - 0.005 AII - 0.330 API + 0.325 AHE$$

All the independent variables were significant predictors of Economic Benefits except Access to Industry Information. The relationship between Economic Benefits and Ability to Choose, Decide and Hold Accountable and Access to Health and Education Benefits was positive while it was negative between Economic Benefits and Ability to Negotiate as well as Access to Productive Inputs.

### 4.3.2 Producer Institutional Framework and Economic Benefits – Certified Coffee Cooperatives

A multiple regression was performed to determine if there was a relationship between the institutional framework of Certified Coffee Cooperatives and economic benefits to farmers who are members of these cooperatives. The regression equation for the Certified Coffee Cooperatives was  $F(5,103)=10.608$ ,  $p=0.000$ , with an  $R^2$  of 0.34. The Certified Coffee Cooperatives model was therefore significant and accounted for 34 per cent of variance.

**Table 4.5 Producer Institutional Framework and Economic Benefits - Certified Coffee Cooperatives**

Independent variable	Beta	t-statistic	Significance p-value
<b>Producer Institutional Framework</b>			
Constant		0.454	0.651
Ability to Choose, Decide and Hold Accountable	0.270	2.591	0.011**
Ability to Negotiate	-0.251	-2.804	0.006**
Access to Industry Information	-0.039	-0.326	0.745
Access to Productive Inputs	-0.297	-2.870	0.005**
Access to Health and Education Benefits	0.381	4.502	0.000**

Key \*\* significant at 5 per cent

Survey data, 2017

Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs and AHE=Access to Health and Educational Benefits, the regression equation for the Certified Coffee Cooperatives model, as depicted in Table 4.5 was therefore:

$$EB = 0.454 + 0.270 \text{ ACDH} - 0.251 \text{ AN} - 0.039 \text{ AII} - 0.297 \text{ API} + 0.381 \text{ AHE}$$

All the independent variables were significant predictors of Economic Benefits except Access to Industry Information. The relationship between Economic Benefits and Ability to Choose, Decide and Hold Accountable and Access to Health and Education Benefits was positive while it was negative between Economic Benefits and Ability to Negotiate as well as Access to Productive Inputs.

### 4.3.3 Producer Institutional Framework and Economic Benefits – Non-certified Coffee Cooperatives

A multiple regression was performed to determine if there was a relationship between the institutional framework of Non-certified Coffee Cooperatives and economic benefits to farmers of who are members of these cooperatives. The regression equation for the Non-certified Coffee Cooperatives was  $F(5,68)=13.152$ ,  $p=0.000$ , with an  $R^2$  of 0.492. The Non-certified Coffee Cooperatives model accounted for 49 per cent of variance.

**Table 4.6 Producer Institutional Framework and Economic Benefits - Non-certified Coffee Cooperatives**

Independent variable	Beta	t-statistic	Significance p-value
<b>Producer Institutional Framework</b>			
Constant		-3.989	0.000**
Ability to Choose, Decide and Hold Accountable	-0.007	-0.074	0.942
Ability to Negotiate	-0.340	-3.307	0.002**
Access to Industry Information	0.051	0.553	0.582
Access to Productive Inputs	-0.344	-3.213	0.002**
Access to Health and Education Benefits	0.253	2.750	0.008**

Key \*\* significant at 5 per cent

Survey data, 2017

Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs and AHE=Access to Health and Educational Benefits, the regression equation for the Non-certified Coffee Cooperatives model, as depicted in Table 4.6 was therefore:

$$EB = - 3.989 - 0.007 ACDH - 0.340 AN + 0.051 AII - 0.344 API + 0.253 AHE.$$

Similar to the Certified Coffee Cooperatives, the equation reveals that Access to Industry Information is not a significant predictor of Economic Benefits. However, among the Non-certified Coffee Cooperatives, the Ability to Choose, Decide and Hold Accountable was also not a significant predictor of Economic Benefits. The relationship between the significant predictors was however similar to the Certified Coffee Cooperatives, as there was a positive relationship between Economic Benefits

and Access to Health and Education Benefits while the relationship between Economic Benefits and Ability to Negotiate as well as Access to Productive Inputs was negative.

#### **4.3.4 Producer Institutional Framework and Economic Benefits – Coffee Estates**

A multiple regression was performed to determine if there was a relationship between the institutional framework of Coffee Estates and economic benefits to farmers who are owners of these estates. The regression equation for the Coffee Estates was  $F(5,22) = 8.251$ ,  $p=0.000$  with an  $R^2$  of 0.652. The Coffee Estates model for 65 per cent of variance and therefore accounted for a higher percentage of variance compared to the other Producer Institutional Arrangements.

**Table 4.7 Producer Institutional Framework and Economic Benefits - Coffee Estates**

Independent variable	Beta	t-statistic	Significance p-value
<b>Producer Institutional Framework</b>			
Constant		-0.955	0.350
Ability to Choose, Decide and Hold Accountable	0.301	2.010	0.057
Ability to Negotiate	-0.156	-1.066	0.298
Access to Industry Information	-0.228	-1.276	0.215
Access to Productive Inputs	-0.525	-2.645	0.015**
Access to Health and Education Benefits	0.287	2.104	0.047**

Key \*\* significant at 5 per cent

Survey data, 2017

Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs and AHE=Access to Health and Educational Benefits, the regression equation for the Coffee Estates model as derived from the results in Table 4.7 was therefore:

$$EB = - 0.955 + 0.301 ACDH - 0.156 AN - 0.228 AII - 0.525 API + 0.287 AHE$$

Similar to the Certified Coffee Cooperatives and the Non-certified Coffee Cooperatives, it was found that Access to Industry Information was not a significant predictor of Economic Benefits. Also similar to the Non-certified Coffee Cooperatives, it was found that Ability to Choose, Decide and Hold Accountable was not a significant predictor of Economic Benefits. The Coffee Estates was however the only Producer Institutional Arrangement where Ability to Negotiate was not a significant predictor of Economic Benefits. The significant predictors were therefore Access to Productive Inputs and Access to Health and Education Benefits. The relationship between Economic Benefits and these two independent variables showed that it was positive between Economic Benefits and Access to Health and Education Benefits and negative between Economic Benefits and Access to Productive Inputs. This was the case across all the Producer Institutional Arrangements.

The findings of objective two therefore led to the rejection of the null hypothesis, which stated that there was no significant relationship between the institutional framework and economic benefits to farmers. The results of the multiple regression show that the Ability to Choose, Decide and Hold Accountable was significant for

Certified Coffee Cooperatives and had a positive relationship to Economic Benefits. Based on the regression equation, respondents from Certified Coffee Cooperatives who indicated that they had the Ability to Choose, Decide and Hold Accountable had increased profitability of with Economic Benefits being higher by 0.27 units. It was therefore concluded that farmers in Certified Coffee Cooperatives were empowered to benefit economically from this ability.

The Ability to Negotiate, contrary to expectation, had a significant and negative relationship to Economic Benefits in both the Certified Coffee Cooperatives and Non-certified Coffee Cooperatives. In the Certified Coffee Cooperatives, the Ability to Negotiate led to a decrease of 0.251 units in Economic Benefits while in the Non-certified Coffee Cooperatives it led to a larger decrease of 0.340 units. The Ability to Negotiate was measured by indicators of being able to and having negotiated with the coffee chain actors such as the millers, marketers and buyers. Various challenges regarding negotiations were cited by respondents from the cooperatives. Among these were verbal guarantees by actors such as millers not being met. Another challenge that was extensively cited was the bribery of farmers by millers in exchange for votes, where the miller was elected by farmers. This reportedly led to the recovery of such monies through means such as exaggerated milling losses. The Ability to Negotiate was therefore detrimental as it reduced the profitability of coffee farmers, particularly in the non-certified cooperatives. This could be attributed to differential power relations between the cooperatives and other coffee chain players such as the millers and marketers, with the farmers being less empowered.

Access to Industry Information was not a significant predictor of Economic Benefits in any of the Producer Institutional Arrangements. Access to Productive Inputs was a significant predictor in all the Producer Institutional Arrangements and also had a negative relationship to Economic Benefits in all the arrangements. It was therefore concluded that that Access to Productive Inputs reduced profitability. The regression equations showed that in the Certified Coffee Cooperatives, Access to Productive Inputs reduced profitability by a reduction of 0.297 units, in the Non-certified Coffee Cooperatives by 0.344 units and in the Coffee Estates by 0.525 units. This could occur due to the inadequacy of the productive inputs, the cost of the inputs or their

untimely arrival. It is therefore concluded that while access to productive inputs reduces profitability in all the Producer Institutional Arrangements, it is least detrimental to profitability in the Certified Coffee Cooperatives and most detrimental in Coffee Estates.

Access to Health and Education Benefits was also significant for all arrangements and had a positive relationship to Economic Benefits in all the arrangements. In Certified Coffee Cooperatives, it increased the economic benefits by 0.381, in Non-certified Coffee Cooperatives by 0.253 and in the Coffee Estates by 0.287. It was therefore concluded that access to social resources results in greater profitability among Certified Coffee Cooperatives as compared to the other institutional arrangements.

Regarding the Ability to Negotiate, a study by Collinson et al found that farmers' bargaining power could be improved through pooling of produce which allowed for economies of scale. They also found that the formation of Farmer Controlled Enterprises (FCEs) enabled produce to be sold further up the marketing chain thereby eliminating at least one level of middlemen, resulting in better net farm-gate prices. Potts, Fernandez and Wunderlich (2007) noted that producers are generally price takers without much ability to influence the terms of trade they face. This study found that the Ability to Negotiate was significant for both the Certified and Non-certified Coffee Cooperatives but not for the Coffee Estates. The Ability to Negotiate was however negatively related to Economic Benefits.

Regarding Access to Industry Information, the World Bank (2005) indicated that the separation of farmers from information regarding their crop grade and classification limited the ability of farmers to make improvements. Dahlman, L. (2008) in a study of certified coffee in Peru noted that obstacles existed to information flows and knowledge transfers particularly in the spending of financial resources. There was also a lack of understanding about Fairtrade concepts. Potts, Fernandez and Wunderlich (2007) identified poor access to market information which they noted was crucial particularly in the context of market volatility. This study found that in all three Producer Institutional Arrangements, there was over 80 per cent access to information on the quality of their coffee. There were however aspects of the coffee

chain where access to information was not readily available, such as coffee marketing.

Regarding Access to Productive Inputs, Potts, Fernandez and Wunderlich (2007) identified limited access to financing noting that many coffee producers only had access to above-market rates. Kalinda and Chibwe (2014) in their study of Zambia's coffee chain also noted lack of financing and high labour costs and Dahlman (2008) in his study of small-scale coffee producers in Peru noted the need for cost cutting strategies. The findings of this study concur with the above studies, as Access to Productive Inputs negatively reduced Economic Benefits in all three Producer Institutional Arrangements. Kherallah and Kirsten (2002) state that grades and standards play a crucial role in providing internationally and quality assurance about a product, thereby reducing information and transaction costs and facilitating international trade. They however note grades and standards can also be used as non-tariff barriers to trade if these standards cannot be met.

The Transaction Cost Economic theory (TCE) explains the significant and negative relationship in all the Producer Institutional Arrangements between Access to Productive Inputs and Economic Benefits. The high cost of inputs, high interest rate on credit, high cost of labour and operational costs all reduced Economic Benefits significantly. The concept of 'bounded rationality' which is part of the New Institutional Economic theory (NIE) posits that decisions are made within the limits of various factors, including the information available. This explains the lack of a significant relationship between Access to Industry Information and Economic Benefits, whereby respondents indicated that they did not have sufficient information regarding aspects such as the coffee marketing system.

Kherallah and Kirsten (2002) note that in many developing countries, the withdrawal of parastatals from the provision of subsidized input and credit to small farmers has not been replaced by the private sector due to challenges such as the inability to enforce contracts with farmers. In this study, it was found that in some cooperatives, millers had stepped into the role of offering credit through advance payment on coffee delivered for milling. This was then deducted from the coffee payments. Kherallah and Kirsten (2002) note some advantages of farmer organizations and

these include a reduction in the transaction costs of accessing input and output markets and improving the negotiation power of smaller farmers in relation to large buyers or sellers. This study found that the transaction costs of accessing a buyer without the use of a marketing agent were deemed to be high by all cooperatives, both certified and non-certified.

The Capability Approach (CA) was used in the study by Jorgensen and Muller (2003) in their study of two coffee cooperatives in Mexico, whereby the cooperative movement was viewed as a collective capability that expanded the capabilities of the individual member or household in a way that would have been difficult for members to achieve individually. This theory is instrumental in this study, as it explains the significant and positive relationship in the Certified Coffee Cooperatives between the Ability to Choose, Decide and Hold Accountable and the Economic Benefits received. The Capability Approach also explains the significant and positive relationship between Access to Social Resources and Economic Benefits in all the Producer Institutional Arrangements, whereby health care benefits and educational assistance were the major forms of assistance.

#### **4.4 Farmer Agency Moderating the Relationship between the Producer Institutional Framework and Economic Benefits**

The third objective of this study was to establish the extent to which Farmer Agency moderated the relationship between the Institutional Framework and Economic Benefits. Farmer Agency had five components: Human Capital Assets, Material Assets, Financial Assets, Organizational Assets and Psychological Assets. Moderated multiple regression was done to accomplish this objective and two approaches were used. The first approach considered Farmer Agency as the composite of its five components. The second approach used each of the five components separately as the moderating variable, so as to determine the effect each had on the relationship between the Institutional Framework and Economic Benefits. The results of the moderated multiple regression using Farmer Agency as a composite of its components are depicted in Table 4.8.

**Table 4.8 Model Summary for the Overall Model**

Mo del	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	SEE	R <sup>2</sup> change	F change	df <sub>1</sub>	df <sub>2</sub>	Sig. F Change
1	0.653	0.426	0.410	0.77021	0.426	25.280	6	204	0.000**
2	0.753	0.567	0.543	0.67746	0.141	12.936	5	199	0.000**

Survey data, 2017

The moderated multiple regression equation for the overall model moderated by Farmer Agency was  $F(5,199) = 23.704$ ,  $p = 0.000$  with an  $R^2$  of 0.567. The change in  $R^2$  after the introduction of Farmer Agency as a moderator was 0.141, indicating that the introduction of Farmer Agency to the model explained the variance in Economic Benefits by an additional 14.1 per cent. The change in the F statistic was 12.936 and this change was significant with  $p = 0.000$ . The null hypothesis was therefore rejected and the conclusion drawn that Farmer Agency had a significant moderating effect.

**Table 4.9 Moderating Effect of Farmer Agency in the Overall Model**

Variable	Beta	t-statistic	Sig. p-value
Constant		-4.078	0.000**
Ability to Choose, Decide and Hold Accountable	0.077	1.330	0.185
Ability to Negotiate	-0.097	-1.749	0.082
Access to Industry Information	-0.035	-0.557	0.578
Access to Productive Inputs	-0.002	-0.023	0.981
Access to Health and Education Benefits	0.115	2.099	0.037**
Farmer Agency	-0.255	-3.120	0.002**
Ability to Choose, Decide & Hold Accountable*Farmer Agency	-0.113	-2.094	0.038**
Ability to Negotiate*Farmer Agency	0.086	0.777	0.438
Access to Industry Information*Farmer Agency	0.082	0.964	0.336
Access to Productive Inputs*Farmer Agency	0.280	2.106	0.036
Access to Health and Education Benefits*Farmer Agency	-0.239	-2.852	0.005**

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, FA = Farmer Agency, ACDH\*FA = Interaction of ACDH and FA, AN\*FA = Interaction of AN and FA, AII\*FA = Interaction of AII and FA, API\*FA = Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.9 was therefore:

$$EB = - 4.078 + 0.077 ACDH - 0.097 AN - 0.035 AII - 0.002 API + 0.115 AHE - 0.255 FA - 0.113 ACDH*FA + 0.086 AN*FA + 0.082 AII*FA + 0.280 API*FA - 0.239 AHE*FA$$

The study found that Farmer Agency significantly predicted Economic Benefits in the overall model ( $\beta = -0.255$ ,  $p = 0.002$ ). The negative coefficient also indicates that Farmer Agency reduced profitability in the overall model by 0.255 units. Additionally, the interaction between Farmer Agency and the Ability to Choose, Decide and Hold Accountable significantly predicted Economic Benefits ( $\beta = -0.113$ ,  $p = 0.038$ ) and the interaction between Farmer Agency and Access to Health and Education Benefits also significantly predicted Economic Benefits ( $\beta = -0.239$ ,  $p = 0.005$ )

**Table 4.10 Model Summary for Certified Coffee Cooperatives**

Mod	R	R <sup>2</sup>	Adjusted	SEE	R <sup>2</sup>	F	df <sub>1</sub>	df <sub>2</sub>	Sig. F
el			R <sup>2</sup>		change	change			Change
1	0.599	0.359	0.322	0.78159	0.359	9.532	6	102	0.000**
2	0.747	0.558	0.508	0.66552	0.199	8.736	5	97	0.000**

Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperative model moderated by Farmer Agency was  $F(5, 97) = 11.142$ ,  $p = 0.000$  with an  $R^2$  of 0.558. The change in  $R^2$  after the introduction of Farmer Agency as a moderator was 0.199, indicating that the introduction of Farmer Agency to the model explained the

variance in Economic Benefits by an additional 19.9 per cent. The change in the F statistic was 8.736 and this change was significant with  $p=0.000$ . The null hypothesis was therefore rejected and the conclusion drawn that Farmer Agency had a significant moderating effect.

**Table 4.11 Moderating Effect of Farmer Agency in Certified Coffee Cooperatives**

Variable	Beta	t-statistic	Sig. p-value
Constant		-1.535	0.128
Ability to Choose, Decide and Hold Accountable	0.196	1.926	0.057
Ability to Negotiate	-0.089	-1.121	0.265
Access to Industry Information	-0.081	-0.768	0.444
Access to Productive Inputs	0.036	0.348	0.728
Access to Health and Education Benefits	0.217	2.612	0.010**
Farmer Agency	-0.728	-2.713	0.008**
Ability to Choose, Decide & Hold Accountable*Farmer Agency	0.292	1.525	0.130
Ability to Negotiate*Farmer Agency	-0.193	-0.953	0.343
Access to Industry Information*Farmer Agency	-0.520	-1.778	0.079
Access to Productive Inputs*Farmer Agency	0.588	2.982	0.004**
Access to Health and Education Benefits*Farmer Agency	-0.395	-2.096	0.039**

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation included the moderator and its interaction terms as independent variables.

Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information,

API=Access to Productive Inputs, AHE = Access to Health and Economic Benefits, FA = Farmer Agency, ACDH\*FA = Interaction of ACDH and FA, AN\*FA = Interaction of AN and FA, AII\*FA = Interaction of AII and FA, API\*FA = Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.11 was therefore:

$$EB = - 1.535 + 0.196 ACDH - 0.089 AN - 0.081 AII + 0.036 API + 0.217 AHE - 0.728 FA + 0.292 ACDH*FA - 0.193 AN*FA - 0.520 AII*FA + 0.588 API*FA - 0.395 AHE*FA$$

The study found that Farmer Agency significantly predicted Economic Benefits in the Certified Coffee Cooperatives model ( $\beta = -0.728$ ,  $p = 0.002$ ). The negative coefficient also indicates that Farmer Agency reduced profitability in the overall model by 0.728 units. Additionally, the interaction between Farmer Agency and the Access to Productive Inputs significantly predicted Economic Benefits ( $\beta = 0.588$ ,  $p = 0.004$ ) and the interaction between Farmer Agency and Access to Health and Education Benefits also significantly predicted Economic Benefits ( $\beta = -0.395$ ,  $p = 0.039$ ).

**Table 4.12 Model Summary for Non-certified Coffee Cooperatives**

Model	R	R <sup>2</sup>	Adjusted R square	SEE	R <sup>2</sup> change	F change	df <sub>1</sub>	df <sub>2</sub>	Sig. F Change
1	0.747	0.558	0.518	0.73076	0.558	14.070	6	67	0.000**
2	0.814	0.663	0.603	0.66292	0.106	3.883	5	62	0.004**

Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperative model moderated by Farmer Agency was  $F(5, 62) = 14.070$ ,  $p = 0.004$  with an  $R^2$  of 0.663. The change in  $R^2$  after the introduction of Farmer Agency as a moderator was 0.106, indicating that the introduction of Farmer Agency to the model explained the variance in Economic Benefits by an additional 10.6 per cent. The

change in the F statistic was 3.883 and this change was significant with  $p = 0.004$ . The null hypothesis was therefore rejected and the conclusion drawn that Farmer Agency had a significant moderating effect.

**Table 4.13 Moderating Effect of Farmer Agency in Non-certified Coffee Cooperatives**

Variable	Beta	t- statistic	Sig. p-value
Constant		-5.374	0.000**
Ability to Choose, Decide and Hold Accountable	-0.026	-0.339	0.736
Ability to Negotiate	0.022	0.194	0.847
Access to Industry Information	0.048	0.583	0.562
Access to Productive Inputs	-0.115	-1.027	0.309
Access to Health and Education Benefits	-0.046	-0.475	0.637
Farmer Agency	-0.434	-3.136	0.003**
Ability to Choose, Decide & Hold Accountable*Farmer Agency	-0.076	-0.778	0.440
Ability to Negotiate*Farmer Agency	0.379	1.322	0.191
Access to Industry Information*Farmer Agency	0.065	0.657	0.514
Access to Productive Inputs*Farmer Agency	-0.133	-0.422	0.675
Access to Health and Education Benefits*Farmer Agency	-0.229	-1.928	0.058

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access

to Health and Economic Benefits, FA = Farmer Agency, ACDH\*FA= Interaction of ACDH and FA, AN\*FA= Interaction of AN and FA, AII\*FA=Interaction of AII and FA, API\*FA=Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.13 was therefore:

$$EB = -5.374 - 0.026 ACDH + 0.022 AN + 0.048 AII - 0.115 API - 0.046 AHE - 0.434 FA - 0.076 ACDH*FA + 0.379 AN*FA + 0.065 AII*FA - 0.133 API*FA - 0.229 AHE*F$$

The study found that Farmer Agency significantly predicted Economic Benefits in the Non-certified Coffee Cooperatives model ( $\beta=-0.434$ ,  $p=0.003$ ). The negative coefficient also indicates that Farmer Agency reduced profitability in the overall model by 0.434 units. No interaction between Farmer Agency and other variables was significant.

**Table 4.14 Model Summary of Coffee Estates**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	SEE	R <sup>2</sup> Change	F change	df <sub>1</sub>	df <sub>2</sub>	Sig. F Change
1	0.860	0.739	0.664	0.58985	0.739	9.913	6	21	0.000**
2	0.932	0.869	0.779	0.47841	0.130	3.184	5	16	0.035**

Survey data, 2017

The moderated multiple regression equation for the Coffee Estates model moderated by Farmer Agency was  $F(5, 16)= 9.913$ ,  $p=0.035$  with an  $R^2$  of 0.869. The change in  $R^2$  after the introduction of Farmer Agency as a moderator was 0.130, indicating that the introduction of Farmer Agency to the model explained the variance in Economic Benefits by an additional 13 per cent. The change in the F statistic was 3.184 and this change was significant with  $p=0.035$ . The null hypothesis was therefore rejected and the conclusion drawn that Farmer Agency had a significant moderating effect.

**Table 4.15 Moderating Effect of Farmer Agency in Coffee Estates**

Independent variable	Beta	t- statistic	Sig. p-value
Constant		-2.748	0.014**
Ability to Choose, Decide and Hold Accountable	-0.006	-0.041	0.968
Ability to Negotiate	0.075	0.473	0.643
Access to Industry Information	-0.307	-1.469	0.161
Access to Productive Inputs	-0.107	-0.337	0.741
Access to Social Resources	0.143	0.860	0.403
Farmer Agency	-0.283	-1.796	0.091
Ability to Choose, Decide & Hold Accountable*Farmer Agency	-0.321	-1.174	0.258
Ability to Negotiate*Farmer Agency	0.631	1.341	0.199
Access to Industry Information*Farmer Agency	-0.173	-0.382	0.707
Access to Productive Inputs*Farmer Agency	-0.022	-0.029	0.977
Access to Health and Education Benefits*Farmer Agency	-0.344	-1.417	0.176

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, FA = Farmer Agency, ACDH\*FA= Interaction of

ACDH and FA, AN\*FA= Interaction of AN and FA, AII\*FA=Interaction of AII and FA, API\*FA=Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.15 was therefore:

$$EB = - 2.748 - 0.006 ACDH + 0.075 AN - 0.307 AII - 0.107 API + 0.143 AHE - 0.283 FA - 0.321 ACDH*FA + 0.631 AN*FA - 0.173 AII*FA - 0.022 API*FA - 0.344 AHE*FA$$

The study found that Farmer Agency did not significantly predict Economic Benefits in the Coffee Estate model and there were no significant interactions between Farmer Agency and other variables.

#### **4.4.1 Moderation by Human Capital Assets of the Relationship between the Institutional Framework and Economic Benefits**

The proxy for Human Capital Assets was the years of schooling and the years that the respondent had been engaged in coffee farming. A moderated multiple regression was carried out with Human Capital Assets as the moderating variable in the relationship between the independent variable of Institutional Framework, comprising the Ability to Choose, Decide and Hold Accountable, Ability to Negotiate, Access to Industry Information, Access to Productive Inputs and Access to Health and Education Benefits and the dependent variable which was Economic Benefits. This was done for each of the three Producer Institutional Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

The null hypothesis was rejected for all three Producer Institutional Arrangements. There was evidence that Human Capital Assets moderated the relationship between the institutional framework and economic benefits. This was depicted by a significant change in the F-static; Certified Coffee Cooperatives,  $p = 0.001$ , Non-certified Coffee Cooperatives,  $p = 0.019$  and Coffee Estates,  $p = 0.010$ . The independent variables were Ability to Choose, Decide and Hold Accountable, Ability to Negotiate, Access to Industry Information, Access to Productive Inputs and

Access to Health and Educational Benefits, while the moderating variable was Human Capital Assets and the dependent variable was Economic Benefits.

**Table 4.16 Moderating Effect of Human Capital Assets in Certified Coffee Cooperatives**

Variable	Beta	t-statistic	p-value
Constant		-0.148	0.883
Ability to Choose, Decide and Hold Accountable	0.043	0.422	0.674
Ability to Negotiate	-0.015	-0.160	0.873
Access to Industry Information	-0.049	-0.448	0.655
Access to Productive Inputs	-0.047	-0.448	0.655
Access to Health and Education Benefits	0.272	3.316	0.001**
Human Capital Assets	-0.194	-2.296	0.024**
Ability to Choose, Decide & Hold Accountable* Human Capital Assets	-0.265	-1.684	0.095
Ability to Negotiate* Human Capital Assets	0.263	1.996	0.049**
Access to Industry Information* Human Capital Assets	0.077	0.467	0.642
Access to Productive Inputs* Human Capital Assets	0.235	1.851	0.067
Access to Health and Education Benefits* Human Capital Assets	0.067	0.654	0.515

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperatives model moderated by Human Capital Assets was  $F(5,97)=9.023$ ,  $p=0.001$  with an  $R^2$  of 0.506. The change in  $R^2$  after the introduction of Human Capital Assets as a moderator was 0.118, indicating that the introduction of Human Capital Assets to the model explained the variance in Economic Benefits by an additional 11.8 percent. The change in the F statistic was 4.630 and this change was significant with  $p=0.001$ .

The null hypothesis was therefore rejected and the conclusion drawn that Human Capital Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, HCA = Human Capital Assets, ACDH\*HCA = Interaction of ACDH and HCA, AN\*HCA = Interaction of AN and HCA, AII\*HCA = Interaction of AII and HCA, API\*HCA = Interaction of API and HCA, AHE\*HCA = Interaction of AHE and HCA, the regression equation derived from the results in Table 4.16 was therefore:

$$EB = - 0.148 + 0.043 \text{ ACDH} - 0.015 \text{ AN} - 0.049 \text{ AII} - 0.047 \text{ API} + 0.272 \text{ AHE} - 0.194 \text{ HCA} - 0.265 \text{ ACDH*HCA} + 0.263 \text{ AN*HCA} + 0.077 \text{ AII*HCA} + 0.235 \text{ API*HCA} + 0.067 \text{ AHE*HCA}$$

The study found that Human Capital Assets significantly predicted Economic Benefits in the Certified Coffee Cooperatives ( $\beta=-0.194$ ,  $p=0.024$ ). The negative coefficient also indicates that Human Capital Assets reduced profitability in Certified Coffee Cooperatives by 0.194 units. Additionally, the interaction between Human Capital Assets and the Ability to Negotiate significantly predicted economic benefits ( $\beta=0.263$ ,  $p=0.049$ ).

**Table 4.17 Moderating Effect of Human Capital Assets in Non-certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-4.212	0.000**
Ability to Choose, Decide and Hold Accountable	-0.015	-0.180	0.858
Ability to Negotiate	-0.197	-1.886	0.064
Access to Industry Information	0.042	0.468	0.641
Access to Productive Inputs	-0.217	-2.018	0.048**
Access to Health and Education Benefits	0.030	0.279	0.781
Human Capital Assets	-0.012	-0.061	0.951
Ability to Choose, Decide & Hold Accountable*	-0.183	-1.685	0.097
Human Capital Assets	0.217	0.768	0.445
Ability to Negotiate* Human Capital Assets	0.012	0.115	0.909
Access to Industry Information* Human Capital Assets	0.287	0.932	0.355
Access to Productive Inputs* Human Capital Assets			
Access to Health and Education Benefits* Human Capital Assets	0.017	0.082	0.935

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperatives model moderated by Human Capital Assets was  $F(5,62)=8.297$ ,  $p=0.019$  with an  $R^2$  of 0.595. The change in  $R^2$  after the introduction of the Human Capital Assets as a moderator was 0.096, indicating that the introduction of Human Capital Assets to the model explained the variance in Economic Benefits by an additional 9.6 percent. The change in the F statistic was 2.952 and this change was significant with  $p=0.019$ . The null hypothesis was therefore rejected and the conclusion drawn that Human Capital Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, HCA = Human Capital Assets, ACDH\*HCA = Interaction of ACDH and HCA, AN\*HCA = Interaction of AN and HCA, AII\*HCA = Interaction of AII and HCA, API\*HCA = Interaction of API and HCA, AHE\*HCA = Interaction of AHE and HCA, the regression equation derived from the results in Table 4.17 was therefore:

$$EB = - 4.212 - 0.015 ACDH - 0.197 AN + 0.042 AII - 0.217 API + 0.030 AHE - 0.012 HCA - 0.183 ACDH*HCA + 0.217 AN*HCA + 0.012 AII*HCA + 0.287API*HCA + 0.017AHE*HCA$$

However, Human Capital Assets were not a significant predictor of Economic Benefits and there was no significant interaction between Human Capital Assets and the independent variables.

**Table 4.18 Moderated Effect of Human Capital Assets in Coffee Estates**

Variable	Beta	t-statistic	p-value
<b>Constant</b>		-2.014	<b>0.061</b>
<b>Ability to Choose, Decide and Hold Accountable</b>	0.073	0.435	<b>0.669</b>
<b>Ability to Negotiate</b>	-0.010	-0.069	<b>0.946</b>
<b>Access to Industry Information</b>	-0.276	-1.644	<b>0.120</b>
<b>Access to Productive Inputs</b>	-0.077	-0.329	<b>0.746</b>
<b>Access to Health and Education Benefits</b>	0.336	2.634	<b>0.018**</b>
<b>Human Capital Assets</b>	0.199	1.142	<b>0.270</b>
<b>Ability to Choose, Decide &amp; Hold Accountable* Human Capital Assets</b>	-0.295	-1.324	<b>0.204</b>
<b>Ability to Negotiate* Human Capital Assets</b>	0.236	0.971	<b>0.346</b>
<b>Access to Industry Information* Human Capital Assets</b>	-0.228	-0.757	<b>0.460</b>
<b>Access to Productive Inputs* Human Capital Assets</b>	0.847	2.489	<b>0.024**</b>
<b>Access to Health and Education Benefits* Human Capital Assets</b>	0.030	0.114	<b>0.911</b>

Key \*\* significant at 5 per cent Survey data, 2017

The moderated multiple regression equation for the Coffee Estate model moderated by Human Capital Assets was  $F(5,16)=8.477$ ,  $p=0.010$  with an  $R^2$  of 0.854. The change in  $R^2$  after the introduction of the Human Capital Assets as a moderator was 0.201, indicating that the introduction of Human Capital Assets to the model explained the variance in Economic Benefits by an additional 20.1 percent. The change in the F statistic was 4.399 and this change was significant with  $p=0.010$ . The null hypothesis was therefore rejected and the conclusion drawn that Human Capital Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, HCA = Human Capital Assets, ACDH\*HCA = Interaction of ACDH and HCA, AN\*HCA = Interaction of AN and HCA, AII\*HCA = Interaction of AII and HCA, API\*HCA = Interaction of API and HCA, AHE\*HCA = Interaction of AHE and HCA, the regression equation derived from the results in Table 4.18 was therefore:

$$EB = -2.014 + 0.073 ACDH - 0.010 AN - 0.276 AII - 0.077 API + 0.336 AHE + 0.199 HCA - 0.295 ACDH*HCA + 0.236 AN*HCA - 0.228 AII*HCA + 0.847 API*HCA + 0.030 AHE*HCA$$

Human Capital Assets were not a significant predictor of Economic benefits. However, there was a significant interaction between Human Capital Assets and Access to Productive Inputs ( $\beta=0.847$ ,  $p=0.024$ ).

#### **4.4.2 Moderation by Material Assets of the Relationship between the Producer Institutional Framework and Economic Benefits**

The proxy for Material Assets was the respondent's number of coffee tree. A moderated multiple regression was carried out with Material Assets as the moderating variable. This was done for all the three Producer Institutional

Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

The null hypothesis was rejected in the moderated multiple regression for both the Certified and Non-certified Coffee Cooperatives. There was evidence that Material Assets moderated the relationship between the Institutional Framework and Economic Benefits in both types of cooperatives, with  $p=0.000$  for Certified Coffee Cooperatives and  $p= 0.038$  for Non-certified Coffee Cooperatives. However in the Coffee Estates with  $p=0.060$ , the null hypothesis was rejected and it was concluded that Material Assets did not moderate the relationship between the Institutional Framework and Economic Benefits.

**Table 4.19 Moderating Effect of Material Assets in Certified Coffee Cooperatives**

Variable	Beta	t-statistic	p-value
Constant		-1.650	0.102
Ability to Choose, Decide and Hold Accountable	0.182	1.809	0.073
Ability to Negotiate	-0.092	-1.176	0.242
Access to Industry Information	-0.065	-0.620	0.537
Access to Productive Inputs	0.038	0.380	0.705
Access to Health and Education Benefits	0.200	2.435	0.017**
Material Assets	-0.767	-3.003	0.003**
Ability to Choose, Decide & Hold Accountable*			
Material Assets	0.180	1.116	0.267
Ability to Negotiate* Material Assets	-0.167	-0.927	0.356
Access to Industry Information* Material Assets	-0.529	-1.824	0.071
Access to Productive Inputs* Material Assets	0.586	3.308	0.001**
Access to Health and Education Benefits* Material			
Assets	-0.411	-2.274	0.025**

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperative model moderated by Material Assets was  $F(5,97)=11.745$ , with an  $R^2$  of 0.571. The change in  $R^2$  after the introduction of Material Assets as a moderator was 0.216, indicating that the introduction of Material Assets to the model explained the variance in Economic Benefits by an additional 21.6 percent. The change in the F statistic was 9.749 and this change was significant with  $p=0.000$ . The null hypothesis was therefore rejected and the conclusion drawn that Material Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, MA = Material Assets, ACDH\*MA = Interaction of ACDH and MA, AN\*MA = Interaction of AN and MA, AII\*MA = Interaction of AII and MA, API\*MA = Interaction of API and MA, AHE\*MA = Interaction of AHE and MA, the regression equation derived from the results in Table 4.19 was therefore:

$$EB = -1.650 + 0.182 \text{ ACDH} - 0.092 \text{ AN} - 0.065 \text{ AII} + 0.038 \text{ API} + 0.200 \text{ AHE} - 0.767 \text{ MA} + 0.180 \text{ ACDH*MA} - 0.167 \text{ AN*MA} - 0.529 \text{ AII*MA} + 0.586 \text{ API*MA} - 0.411 \text{ AHE*MA}$$

Material Assets were a significant predictor of Economic Benefits ( $\beta=-0.767$ ,  $p=0.003$ ). This indicated that profitability reduced with increased material assets, whose proxy was the number of coffee trees. This can be partially explained by the attendant costs of an increased number of trees, such as labour and agricultural inputs. Additionally, there was a significant interaction between Material Assets and Access to Productive Inputs ( $\beta=0.586$ ,  $p=0.001$ ) and between Material Assets and Access to Health and Educational Benefits ( $\beta=-0.411$ ,  $p=0.025$ ).

**Table 4.20 Moderating Effect of Material Assets in Non-certified Coffee Cooperatives**

Variable	Beta	t-statistic	p-value
Constant		-4.474	0.000**
Ability to Choose, Decide and Hold Accountable	0.019	0.228	0.821
Ability to Negotiate	-0.092	-0.811	0.420
Access to Industry Information	0.050	0.564	0.574
Access to Productive Inputs	-0.232	-2.038	0.046**
Access to Health and Education Benefits			
Material Assets	-0.095	-0.732	0.467
Ability to Choose, Decide & Hold Accountable*	-0.396	-2.876	0.006**
Material Assets	-0.029	-0.264	0.793
Ability to Negotiate* Material Assets	0.563	1.605	0.114
Access to Industry Information* Material Assets	0.017	0.162	0.872
Access to Productive Inputs* Material Assets	-0.182	-0.621	0.537
Access to Health and Education Benefits* Material Assets	0.022	0.115	0.909

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperatives model moderated by Material Assets was  $F(5,62)=9.014$ , with an  $R^2$  of 0.615. The change in  $R^2$  after the introduction of the Material Assets as a moderator was 0.078, indicating that the introduction of Material Assets to the model explained the variance in Economic Benefits by an additional 7.8 percent. The change in the F statistic was 2.522 and this change was significant with  $p=0.038$ . The null hypothesis was therefore rejected and the conclusion drawn that Material Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH

= Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, MA = Material Assets, ACDH\*MA = Interaction of ACDH and MA, AN\*MA = Interaction of AN and MA, AII\*MA = Interaction of AII and MA, API\*MA = Interaction of API and MA, AHE\*MA = Interaction of AHE and MA, the regression equation derived from the results in Table 4.20 was therefore:

$$EB = - 4.474 + 0.019 \text{ ACDH} - 0.092 \text{ AN} + 0.050 \text{ AII} - 0.232 \text{ API} - 0.095 \text{ AHE} - 0.396 \text{ MA} - 0.029 \text{ ACDH*MA} + 0.563 \text{ AN*MA} + 0.017 \text{ AII*MA} - 0.182 \text{ API*MA} + 0.022 \text{ AHE*MA}$$

It was found that Material Assets significantly predicted Economic Benefits ( $\beta = -0.396$ ,  $p = 0.006$ ). This indicated that profitability reduced with an increasing number of trees. There was however no significant interaction between Material Assets and the independent variables.

**Table 4.21 Moderating Effect of Material Assets in Coffee Estates**

Variable	Beta	t-statistic	p-value
Constant		-2.302	0.035**
Ability to Choose, Decide and Hold Accountable	-0.002	-0.011	0.992
Ability to Negotiate	0.066	0.370	0.716
Access to Industry Information	-0.317	-1.325	0.204
Access to Productive Inputs	-0.182	-0.514	0.614
Access to Health and Education Benefits	0.144	0.784	0.444
Material Assets	-0.264	-1.635	0.122
Ability to Choose, Decide & Hold Accountable* Material Assets	-0.385	-1.246	0.231
Ability to Negotiate* Material Assets	0.701	1.735	0.102
Access to Industry Information* Material Assets	-0.244	-0.481	0.637
Access to Productive Inputs* Material Assets	-0.035	-0.048	0.962

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Access to Health and Education Benefits* Material			
Assets	-0.326	-1.256	0.227

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Key \*\* significant at 5 per cent

Survey data, 2017

The moderated multiple regression equation for the Coffee Estates model moderated by Material Assets was  $F(5,16)=8.120$ , with an  $R^2$  of 0.848. The change in  $R^2$  after the introduction of the Material Assets as a moderator was 0.128, indicating that the introduction of Material Assets to the model explained the variance in Economic Benefits by an additional 12.8 percent. The change in the F statistic was 2.692 and this change was not significant with  $p=0.060$ . The null hypothesis was therefore accepted and the conclusion drawn that Material Assets had no statistically significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII = Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, MA = Material Assets, ACDH\*MA = Interaction of ACDH and MA, AN\*MA = Interaction of AN and MA, AII\*MA = Interaction of AII and MA, API\*MA = Interaction of API and MA, AHE\*MA = Interaction of AHE and MA, the regression equation derived from the results in Table 4.21 was therefore:

$$EB = - 2.302 - 0.002 ACDH + 0.066 AN - 0.317 AII - 0.182 API + 0.144 AHE - 0.264 MA - 0.385 ACDH*MA + 0.701 AN*MA - 0.244 AII*MA - 0.035 API*MA - 0.326 AHE*MA$$

#### **4.4.3 Moderation by Financial Assets of the Relationship between the Producer Institutional Framework and Economic Benefits**

The proxy for Financial Assets was an income other than coffee income. A moderated multiple regression was carried out with Financial Assets as the moderating variable. This was done for all the three Producer Institutional

Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

In the Certified Coffee Cooperatives with  $p=0.000$  and in the Coffee Estates with  $p=0.003$ , the null hypothesis was rejected and it was concluded that Financial Assets moderated the relationship between the Institutional Framework and Economic Benefits. However in the Non-certified Coffee Cooperatives with  $p=0.226$ , the null hypothesis was accepted and it was concluded that Financial Assets do not moderate the relationship between the Institutional Framework and Economic Benefits.

**Table 4.22 Moderating Effect of Financial Assets in Certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-0.417	0.678
Ability to Choose, Decide and Hold Accountable	0.083	0.852	0.396
Ability to Negotiate	-0.120	-1.480	0.142
Access to Industry Information	0.005	0.046	0.963
Access to Productive Inputs	-0.072	-0.757	0.451
Access to Health and Education Benefits	0.241	2.771	0.007**
Financial Assets	-0.141	-1.315	0.191
Ability to Choose, Decide & Hold Accountable*			
Financial Assets	-0.189	-1.608	0.111
Ability to Negotiate* Financial Assets	0.113	1.039	0.301
Access to Industry Information* Financial Assets	-0.023	-0.170	0.865
Access to Productive Inputs* Financial Assets	0.454	4.203	0.000**
Access to Health and Education Benefits* Financial			
Assets	-0.055	-0.615	0.540

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperative model moderated by Financial Assets was  $F(5,97)=10.613$ , with an  $R^2$  of 0.546. The change in  $R^2$  after the introduction of Financial Assets as a moderator was 0.130, indicating that the introduction of Financial Assets to the model explained the variance in Economic Benefits by an additional 13 percent. The change in the F statistic was 5.553 and this change was significant with  $p=0.000$ . The null hypothesis was therefore rejected and the conclusion drawn that Financial Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, FA = Financial Assets, ACDH\*FA= Interaction of ACDH and FA, AN\*FA= Interaction of AN and FA, AII\*FA=Interaction of AII and FA, API\*FA=Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.22 was therefore:

$$EB = - 0.417 + 0.083 \text{ ACDH} - 0.120 \text{ AN} + 0.005 \text{ AII} - 0.072 \text{ API} + 0.241 \text{ AHE} - 0.141 \text{ FA} - 0.189 \text{ ACDH*FA} + 0.113 \text{ AN*FA} - 0.023 \text{ AII*FA} + 0.454 \text{ API*FA} - 0.055 \text{ AHE*FA}$$

While Financial Assets were not a significant predictor of Economic Benefits, the interaction between Financial Assets and Access to Productive Inputs was significant ( $\beta=0.454$ ,  $p=0.000$ ).

**Table 4.23 Moderating Effect of Financial Assets in Non-certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-3.820	0.000**
Ability to Choose, Decide and Hold Accountable	-0.013	-0.138	0.891
Ability to Negotiate	-0.207	-1.828	0.072

Access to Industry Information	0.091	0.895	0.374
Access to Productive Inputs	-0.243	-2.049	0.045**
Access to Health and Education Benefits			
Financial Assets	0.058	0.475	0.636
Ability to Choose, Decide & Hold Accountable*	-0.008	-0.073	0.942
Financial Assets	-0.060	-0.603	0.549
Ability to Negotiate* Financial Assets	0.120	0.563	0.575
Access to Industry Information* Financial Assets	-0.013	-0.118	0.907
Access to Productive Inputs* Financial Assets	-0.100	-0.422	0.674
Access to Health and Education Benefits* Financial			
Assets	-0.384	-1.761	0.083

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperative model moderated by Financial Assets was  $F(5,62)=6.867$ , with an  $R^2$  of 0.549. The change in  $R^2$  after the introduction of the Financial Assets as a moderator was 0.052, indicating that the introduction of Financial Assets to the model explained the variance in Economic Benefits by an additional 5.2 percent. The change in the F statistic was 1.430 and this change was not significant with  $p=0.226$ . The null hypothesis was therefore accepted and the conclusion drawn that Financial Assets had no statistically significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB = Economic Benefits, ACDH = Ability to Choose, Decide and Hold Accountable, AN = Ability to Negotiate, AII=Access to Industry Information, API = Access to Productive Inputs, AHE = Access to Health and Economic Benefits, FA = Financial Assets, ACDH\*FA = Interaction of ACDH and FA, AN\*FA = Interaction of AN and FA, AII\*FA = Interaction of AII and FA, API\*FA = Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.23 was therefore:

$$EB = -3.820 - 0.013 ACDH - 0.207 AN + 0.091 AII - 0.243 API + 0.058 AHE - 0.008 FA - 0.060 ACDH*FA + 0.120 AN*FA - 0.013 AII*FA - 0.100 API*FA - 0.384 AHE*FA.$$

**Table 4.24 Moderating Effect of Financial Assets in Coffee Estates**

Variable	Beta	t-statistic	p-value
Constant		-2.991	0.009**
Ability to Choose, Decide and Hold Accountable	0.076	0.572	0.576
Ability to Negotiate	0.116	0.875	0.395
Access to Industry Information	-0.282	-1.981	0.065
Access to Productive Inputs	0.043	0.231	0.820
Access to Health and Education Benefits			
Financial Assets	0.417	3.875	0.001**
Ability to Choose, Decide & Hold Accountable* Financial Assets			
Financial Assets	-0.209	-1.508	0.151
Ability to Negotiate* Financial Assets	-0.200	-1.733	0.102
Access to Industry Information* Financial Assets	0.396	2.510	0.023**
Access to Productive Inputs* Financial Assets	-0.327	-1.707	0.107
Access to Health and Education Benefits* Financial Assets	0.641	2.670	0.017**
Assets	0.110	0.810	0.430

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Coffee Estates model moderated by Financial Assets was  $F(5,16) = 11.748$ , with an  $R^2$  of 0.890. The change in  $R^2$  after the introduction of the Financial Assets as a moderator was 0.198, indicating that the introduction of Financial Assets to the model explained the variance in Economic Benefits by an additional 19.8 percent. The change in the F statistic was 5.739 and this change was significant with  $p = 0.003$ . The null hypothesis was therefore accepted and the conclusion drawn that Financial Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, FA = Financial Assets, ACDH\*FA= Interaction of ACDH and FA, AN\*FA= Interaction of AN and FA, AII\*FA=Interaction of AII and FA, API\*FA=Interaction of API and FA, AHE\*FA = Interaction of AHE and FA, the regression equation derived from the results in Table 4.24 was therefore:

$$EB = - 2.991 + 0.076 ACDH + 0.116 AN - 0.282 AII + 0.043 API + 0.417 AHE - 0.209 FA - 0.200 ACDH*FA + 0.396 AN*FA - 0.327 AII*FA + 0.641 API*FA + 0.110 AHE*FA$$

Financial Assets were not a significant predictor of Economic Benefits. However, there was a significant interaction between Financial Assets and Ability to Negotiate ( $\beta=0.396$ ,  $p=0.023$ ) and between Financial Assets and Access to Productive Inputs ( $\beta=0.641$ ,  $p=0.017$ ).

#### **4.4.4 Moderation by Organizational Assets of the Relationship between the Producer Institutional Framework and Economic Benefits**

The proxy for Organizational Assets was membership in an economic self-help group (SHG). A moderated multiple regression was carried out with Organizational Assets as the moderating variable. This was done for all the three Producer Institutional Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

In the Certified Coffee Cooperatives with  $p=0.000$  and in the Coffee Estates with  $p=0.005$ , the null hypothesis was rejected and it was concluded that Organizational Assets moderated the relationship between the Institutional Framework and Economic Benefits. For the Non-certified Coffee Cooperatives with  $p=0.424$  however, the null hypothesis was accepted and it was concluded that Organizational Assets did not moderate the relationship between the Institutional Framework and Economic Benefits.

**Table 4.25 Moderating Effect of Organizational Assets in Certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-0.143	0.886
Ability to Choose, Decide and Hold Accountable	0.158	1.471	0.145
Ability to Negotiate	-0.060	-0.560	0.577
Access to Industry Information	-0.033	-0.291	0.772
Access to Productive Inputs	-0.102	-0.943	0.348
Access to Health and Education Benefits	0.307	3.230	0.002**
Organizational Assets	-0.040	-0.451	0.653
Ability to Choose, Decide & Hold Accountable*			
Organizational Assets	-0.003	-0.031	0.975
Ability to Negotiate* Organizational Assets	0.221	1.676	0.097
Access to Industry Information* Organizational Assets	-0.150	-1.344	0.182
Access to Productive Inputs* Organizational Assets	0.320	2.679	0.009**
Access to Health and Education Benefits*			
Organizational Assets	-0.065	-0.657	0.513

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperatives model moderated by Organizational Assets was  $F(5,97) = 8.678$ , with an  $R^2$  of 0.496. The change in  $R^2$  after the introduction of the Organizational Assets as a moderator was 0.130, indicating that the introduction of Organizational Assets to the model explained the variance in Economic Benefits by an additional 13 percent. The change in the F statistic was 4.989 and this change was significant with  $p=0.000$ . The null hypothesis was therefore rejected and the conclusion drawn that Organizational Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits,

ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, OA = Organizational Assets, ACDH\*OA= Interaction of ACDH and OA, AN\*OA= Interaction of AN and OA, AII\*OA=Interaction of AII and OA, API\*OA=Interaction of API and OA, AHE\*OA = Interaction of AHE and OA, the regression equation derived from the results in Table 4.25 was therefore:

$$EB = - 0.143 + 0.158 \text{ ACDH} - 0.060 \text{ AN} - 0.033 \text{ AII} - 0.102 \text{ API} + 0.307 \text{ AHE} - 0.040 \text{ OA} - 0.003 \text{ ACDH*OAs} + 0.221 \text{ AN*OA} - 0.150 \text{ AII*OA} + 0.320 \text{ API*OA} - 0.065 \text{ AHE*OA}$$

While Organizational Assets were not a significant predictor of Economic Benefits, there was a significant interaction between Organizational Assets and Access to Productive Inputs ( $\beta=0.320$ ,  $p=0.009$ ).

**Table 4.26 Moderating Effect of Organizational Assets in Non-certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-2.457	0.017**
Ability to Choose, Decide and Hold Accountable	0.000	0.004	0.997
Ability to Negotiate	-0.297	-2.581	0.012**
Access to Industry Information	0.082	0.805	0.424
Access to Productive Inputs	-0.225	-1.718	0.091
Access to Health and Education Benefits	0.017	0.112	0.911
Organizational Assets	-0.004	-0.030	0.976
Ability to Choose, Decide & Hold Accountable*	-0.009	-0.094	0.926
Organizational Assets			
Ability to Negotiate* Organizational Assets	0.096	0.527	0.600
Access to Industry Information* Organizational Assets	-0.025	-0.223	0.825
Access to Productive Inputs* Organizational Assets	-0.070	-0.344	0.732

Access to Health and Education Benefits*	-0.359	-1.677	0.099
Organizational Assets			

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperatives model moderated by Organizational Assets was  $F(5,62)=6.556$ , with an  $R^2$  of 0.538. The change in  $R^2$  after the introduction of Organizational Assets as a moderator was 0.037, indicating that the introduction of Organizational Assets to the model explained the variance in Economic Benefits by an additional 3.7 percent. The change in the F statistic was 1.003 and this change was not significant with  $p=0.424$ . The null hypothesis was therefore accepted and the conclusion drawn that Organizational Assets had no significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, OA = Organizational Assets, ACDH\*OA= Interaction of ACDH and OA, AN\*OA= Interaction of AN and OA, AII\*OA=Interaction of AII and OA, API\*OA=Interaction of API and OA, AHE\*OA = Interaction of AHE and OA, the regression equation derived from the results in Table 4.26 was therefore:

$$EB = - 2.457 + 0.000 ACDH - 0.297 AN + 0.082 AII - 0.225 API + 0.017 AHE - 0.004 OA - 0.009 ACDH*OA + 0.096 AN*OA - 0.025 AII*OA - 0.070 API*OA - 0.359 AHE*OA$$

**Table 4.27 Moderating Effect of Organizational Assets in Coffee Estates**

Variable	Beta	t- statistic	p-value
Constant		-2.432	0.027**
Ability to Choose, Decide and Hold Accountable	0.036	0.286	0.779

Ability to Negotiate	-0.017	-0.151	0.882
Access to Industry Information	-0.299	-2.302	0.035**
Access to Productive Inputs	-0.057	-0.310	0.760
Access to Health and Education Benefits	0.388	3.525	0.003**
Organizational Assets	-0.079	-0.455	0.655
Ability to Choose, Decide & Hold Accountable*			
Organizational Assets	-0.259	-1.846	0.084
Ability to Negotiate* Organizational Assets	0.395	2.669	0.017**
Access to Industry Information* Organizational Assets	-0.110	-0.731	0.476
Access to Productive Inputs* Organizational Assets	0.424	1.447	0.167
Access to Health and Education Benefits*			
Organizational Assets	0.003	0.019	0.985

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Coffee Estates model moderated by Organizational Assets was  $F(5,16)=10.529$ , with an  $R^2$  of 0.879. The change in  $R^2$  after the introduction of the Organizational Assets as a moderator was 0.197, indicating that the introduction of Organizational Assets to the model explained the variance in Economic Benefits by an additional 19.7 percent. The change in the F statistic was 5.188 and this change was significant with  $p=0.005$ . The null hypothesis was therefore rejected and the conclusion drawn that Organizational Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, OA = Organizational Assets, ACDH\*OA= Interaction of ACDH and OA, AN\*OA= Interaction of AN and OA, AII\*OA=Interaction of AII and OA, API\*OA=Interaction of API and OA, AHE\*OA = Interaction of AHE and OA, the regression equation derived from the results in Table 4.27 was therefore:

$$EB = -2.432 + 0.036 ACDH - 0.017 AN - 0.299 AII - 0.057 API + 0.388 AHE - 0.079 OA - 0.259 ACDH*OA + 0.395 AN*OA - 0.110 AII*OA + 0.424 API*OA + 0.003 AHE*OA$$

While Organizational Assets were not a significant predictor of Economic Benefits, there was a significant interaction between Organizational Assets and Ability to Negotiate ( $\beta=0.395$ ,  $p=0.017$ ).

#### 4.4.5 Moderation by Psychological Assets of the Relationship between the Producer Institutional Framework and Economic Benefits

The proxy for Psychological Assets was the perception of success in coffee farming as depicted by the ability to improve yields and ability to increase quantity. A moderated multiple regression was done with Psychological Assets as the moderating variable. This was done for all the three Producer Institutional Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates.

In the Certified Coffee Cooperatives with  $p=0.001$  and the Coffee Estates with  $p=0.001$ , the null hypothesis was rejected and it was concluded that Psychological Assets moderate the relationship between the Institutional Framework and Economic Benefits. For the Non-certified Coffee Cooperatives with  $p=0.141$  however, the null hypothesis was accepted and it was concluded that Psychological Assets did not moderate the relationship between the Institutional Framework and Economic Benefits.

**Table 4.28 Moderating Effect of Psychological Assets in Certified Coffee Cooperatives**

Variable	Beta	t-statistic	p-value
Constant		-0.882	0.380
Ability to Choose, Decide and Hold Accountable	0.222	2.281	0.025**
Ability to Negotiate	-0.153	-1.708	0.091
Access to Industry Information	-0.042	-0.359	0.720

Access to Productive Inputs	-0.226	-1.980	0.051
Access to Health and Education Benefits	0.291	3.312	0.001**
Psychological Assets	-0.124	-1.135	0.259
Ability to Choose, Decide & Hold Accountable*			
Psychological Assets	-0.145	-1.224	0.224
Ability to Negotiate* Psychological Assets	0.126	1.126	0.263
Access to Industry Information* Psychological Assets	0.149	1.096	0.276
Access to Productive Inputs* Psychological Assets	0.201	1.592	0.115
Access to Health and Education Benefits*			
Psychological Assets	0.071	0.730	0.467

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Certified Coffee Cooperative model moderated by Psychological Assets was  $F(5,97)=8.293$ , with an  $R^2$  of 0.485. The change in  $R^2$  after the introduction of the Psychological Assets as a moderator was 0.126, indicating that the introduction of Psychological Assets to the model explained the variance in Economic Benefits by an additional 12.6 percent. The change in the F-statistic was 4.739 and this change was significant with  $p=0.001$ . The null hypothesis was therefore rejected and the conclusion drawn that Psychological Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, PA = Psychological Assets, ACDH\*PA= Interaction of ACDH and PA, AN\*PA= Interaction of AN and PA, AII\*PA=Interaction of AII and PA, API\*OA=Interaction of API and PA, AHE\*PA = Interaction of AHE and PA, the regression equation derived from the results in Table 4.28 was therefore:

$$EB = - 0.882 + 0.222 ACDH - 0.153 AN - 0.042 AII - 0.226 API + 0.291 AHE - 0.124 PA - 0.145 ACDH*PA + 0.126 AN*PA + 0.149 AII*PA + 0.201 API*PA + 0.071 AHE*PA$$

Using the product-indicator approach, it was established that there was no significant interaction between Psychological Assets and the independent variables.

**Table 4.29 Moderating Effect of Psychological Assets in Non-certified Coffee Cooperatives**

Variable	Beta	t- statistic	p-value
Constant		-2.994	0.004**
Ability to Choose, Decide and Hold Accountable	-0.024	-0.225	0.823
Ability to Negotiate	-0.151	-1.257	0.214
Access to Industry Information	0.112	0.958	0.342
Access to Productive Inputs	-0.267	-2.033	0.046**
Access to Health and Education Benefits	0.014	0.120	0.905
Psychological Assets	-0.034	-0.238	0.813
Ability to Choose, Decide & Hold Accountable*			
Psychological Assets	0.014	0.147	0.883
Ability to Negotiate* Psychological Assets	0.392	1.750	0.085
Access to Industry Information* Psychological Assets	0.021	0.164	0.870
Access to Productive Inputs* Psychological Assets	-0.231	-0.902	0.370
Access to Health and Education Benefits*			
Psychological Assets	-0.277	-1.638	0.107

Key \*\* significant at 5 per cent

Survey data, 2017

The moderated multiple regression equation for the Non-certified Coffee Cooperative model moderated by Psychological Assets was  $F(5,62)=7.246$ , with an  $R^2$  of 0.562. The change in  $R^2$  after the introduction of the Psychological Assets as a moderator was 0.061, indicating that the introduction of Psychological Assets to the

model explained the variance in Economic Benefits by an additional 6.1 percent. The change in the F statistic was 1.729 and this change was not with  $p=0.141$ . The null hypothesis was therefore accepted and the conclusion drawn that Psychological Assets had no statistically significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, OA = Organizational Assets, ACDH\*OA= Interaction of ACDH and OA, AN\*OA= Interaction of AN and OA, AII\*OA=Interaction of AII and OA, API\*OA=Interaction of API and OA, AHE\*OA = Interaction of AHE and OA, the regression equation derived from the results in Table 4.29 was therefore:

$$EB = - 2.994 - 0.024 ACDH - 0.151 AN + 0.112 AII - 0.267 API + 0.014 AHE - 0.034 PA + 0.014 ACDH*PA + 0.392 AN*PA + 0.021 AII*PA - 0.231 API*PA - 0.277 AHE*PA$$

Using the product-indicator approach, it was established that there was no significant interaction between Psychological Assets and the independent variables.

**Table 4.30 Moderating Effect of Psychological Assets in Coffee Estates**

Variable	Beta	t- statistic	p-value
Constant		-3.455	0.003**
Ability to Choose, Decide and Hold Accountable	0.043	0.403	0.692
Ability to Negotiate	0.050	0.408	0.689
Access to Industry Information	-0.206	-1.537	0.144
Access to Productive Inputs	0.012	0.067	0.948
Access to Health and Education Benefits	0.412	3.446	0.003**
Psychological Assets	-0.003	-0.019	0.985
Ability to Choose, Decide & Hold Accountable*			

Psychological Assets	-0.041	-0.395	0.698
Ability to Negotiate* Psychological Assets	0.050	0.240	0.813
Access to Industry Information* Psychological Assets	-0.349	-1.713	0.106
Access to Productive Inputs* Psychological Assets	0.881	2.939	0.010**
Access to Health and Education Benefits* Psychological Assets	-0.189	-1.134	0.274

Key \*\* significant at 5 per cent  
Survey data, 2017

The moderated multiple regression equation for the Coffee Estates model moderated by Psychological Assets was  $F(5,16)=12.489$ , with an  $R^2$  of 0.896. The change in  $R^2$  after the introduction of Psychological Assets as a moderator was 0.231, indicating that the introduction of Psychological Assets to the model explained the variance in Economic Benefits by an additional 23.1 percent. The change in the F statistic was 7.094 and this change was significant with  $p=0.001$ . The null hypothesis was therefore rejected and the conclusion drawn that Psychological Assets had a significant moderating effect.

The moderated multiple regression equation included the moderator and its interaction terms as independent variables. Where EB=Economic Benefits, ACDH=Ability to Choose, Decide and Hold Accountable, AN=Ability to Negotiate, AII=Access to Industry Information, API=Access to Productive Inputs, AHE=Access to Health and Economic Benefits, OA = Organizational Assets, ACDH\*OA= Interaction of ACDH and OA, AN\*OA= Interaction of AN and OA, AII\*OA=Interaction of AII and OA, API\*OA=Interaction of API and OA, AHE\*OA = Interaction of AHE and OA, the regression equation derived from the results in Table 4.30 was therefore:

$$EB = - 3.455 + 0.043 ACDH + 0.050 AN - 0.206 AII + 0.012 API + 0.412 AHE - 0.003 PA - 0.041 ACDH*PA + 0.050 AN*PA - 0.349 AII*PA + 0.881 API*PA - 0.189 AHE*PA$$

Using the product-indicator approach, it was established that there was a significant interaction between Psychological Assets and Access to Productive Inputs ( $\beta=0.881$ ,  $p=0.010$ ).

## **4.5 Discussion of Results**

In discussing the research findings, the theories used and the findings from other studies enabled an analysis. The first objective was characterizing the Producer Institutional Arrangements and this was done through a description of the sample characteristics, a profile of the Producer Institutional Arrangements and of the actors and the processes of the coffee commodity chain. The New Institutional Economics (NIE) theory recognizes the importance of institutions in economics. This study found that coffee cooperatives are the dominant institutional arrangement of coffee farmers in Kenya, as cooperative membership is mandatory for small-scale coffee farmers. This can be attributed to coffee being a key indicator of national economic growth in terms of its contribution to the Gross Domestic Product (GDP), foreign exchange and employment.

Cooperatives are therefore institutions that can be a means of ensuring steady production, maintaining coffee quality and streamlining the provision of inputs such as fertilizers as well as activities related to the processing, marketing and selling of coffee. Institutional arrangements such as cooperatives, by virtue of their large membership, are also deemed an asset in electoral politics. The management and organization of cooperatives can therefore be influenced by politics, with members opting to disaffiliate from the cooperative to form a new one or conversely merging with other cooperatives. This was evident in Nyeri County where three of the initial four coffee cooperatives split into single factory cooperatives. While some responded to a government directive to merge, others chose to remain as single-factory cooperatives. None of these cooperatives have since the directive opted to voluntarily merge with other cooperatives. The TCE theory enabled an analysis of the activities undertaken by the institutional arrangements to minimize costs and maximize on economic benefits.

Both certified and non-certified cooperatives undertook various measures to reduce their transaction costs. During periods of low production, some factories operated as collection centers to save on operational expenses. Cooperatives also endeavored to reduce costs through control of additional aspects of the coffee chain. Three

cooperatives had acquired their own mill while three engaged in the roasting and packaging of their coffee, with one cooperative owning their roaster while the other two outsourced this activity. However, the amount roasted and packaged for domestic consumption was insignificant in comparison to the volume exported as green coffee. Obtaining a license for a coffee estate requires that a farmer obtain the machinery and equipment for a pulping station as well as have the capacity to meet the operational expenses involved in pulping and drying coffee. 83 per cent of estate owners were once cooperative members which is indicative of perceived benefits to estate farming. However, it was common for estate owners to retain cooperative membership even after obtaining a coffee estate license, so as to enable delivery of cherry to cooperatives during seasons of low production so as to save on costs.

While the institutional framework in all arrangements stipulated that millers and marketers should be separate legal entities, in all the arrangements, there was the use of millers and marketers who were affiliated. The transaction costs of utilizing marketers not affiliated with the miller were deemed to be high, as it allegedly resulted in low coffee prices, with millers blaming the marketer citing poor marketing while marketers pointed to low coffee grade or class. There were also cooperatives that had obtained a grower-marketer license to enable them market their coffee. They had however opted to continue using a marketing agent, citing high costs in the transactions involved in marketing coffee, including in getting information related to marketing and in transacting with the buyers. Regarding certification of coffee, it was perceived as a means of increasing economic benefits to farmers, as certified coffee was expected to command higher prices.

This however was not the case across all cooperatives due to reasons such as lack of sufficient quantity demanded. High quality coffee also commanded higher prices regardless of whether it was certified or not. There were therefore instances of coffee from non-certified cooperatives fetching higher prices than that of certified cooperatives. In terms of marketing, cooperatives that had certified coffee also used the conventional marketing channels and were therefore exposed to the same challenges faced by non-certified cooperatives. Challenges faced by estates were similar with those of cooperatives in terms of transactions with other coffee chain

actors such as millers, marketers and buyers. However, Coffee Estates had a higher payout rate compared to either the certified or non-certified cooperatives.

The Capability Approach enabled an understanding of the individual choices made by farmers. Personal agency was utilized in making choices with an aim to achieving the 'desirable outcome' of acquiring economic benefits. Choices that were of personal economic benefit could however impact negatively on the economic benefits of the cooperative as a whole. Key informants for example reported that some farmers engaged in cherry hawking, while others obtained fertilizer on credit from the cooperative and then sold it or used it on other crops. Estate farmers also delivered cherry to the cooperative when production was low, so as to reduce the costs involved in pulping cherry. Dormant farmers were a feature in all Producer Institutional Arrangements. In the cooperatives, key informants indicated that there were farmers who opted not to deliver cherry to the factory as they were unwilling to wait for the long period before payment. Delivery to the factory also meant that deductions would be made for inputs taken on credit before remitting payments to the farmer. To circumvent the long waiting period and the reduced payment after input deduction, farmers opted to engage in cherry hawking, which involved selling of cherry to other farmers or coffee brokers, so as to receive immediate payment. This was detrimental to other cooperative members, as the cooperative did not recover the amount spent on providing inputs for credit and had decreased income due to the decreased amount of cherry delivered to the factories.

Regarding the second and third objective that pertained to the relationship between the institutional framework and economic benefits and the moderating role of farmer agency in this relationship, it was determined that all the moderating variables had a significant effect on the Certified Coffee Cooperatives model. However among the Non-certified Coffee Cooperatives, only Human Capital Assets and Material Assets had a significant moderating effect. Among the Coffee Estates, all moderating variables had a significant effect except Material Assets.

Gitu (2012) found that members with higher levels of education received higher incomes from coffee. Sharma, Pandit, White and Polyakov (2015) found that household education increased income through access to off-farm domestic and

international labour markets. Kamau et al (2011) in their study to estimate the impact of UTZ certification on the welfare of coffee farming households found that although not significant, higher education level and farming experience had a negative influence in participation in a certification program in Kiambu but a positive one in Nyeri. Nkurunziza (2014) in a study in Rwanda found that higher education levels negatively influenced the decision to participate in cooperatives. Other studies that have evaluated certification have also found it to have a positive impact on coffee farmers. For example, in their evaluation of C.A.F.E. practices, a coffee certification program, Semroc, Baer, Sonenshine and Weikel (2012) used various indicators to measure access to education and this included the percentage of small farms where children of legal school age attended schools where available and did not work during school hours. They found there was one hundred percent compliance for this indicator. In measuring access to medical care, they found that 44 percent of medium and large farms provided in-kind or financial support to the operation of local medical facilities. Some farms also subsidized healthcare costs with 87 percent of full-time workers and 71 percent of all workers being provided with offsets to healthcare costs.

In this study, years of schooling was part of the moderating variable of human capital assets, coupled with years of farming. This study found that Human Capital Assets had a significant moderating effect between the Institutional Framework and Economic Benefits in all Producer Institutional Arrangements. It was also found that Human Capital Assets had a negative relationship to Economic Benefits in the Certified Coffee Cooperatives.

kurunziza (2014) found that large farm size negatively influenced the decision to participate in coffee cooperatives. This study used the number of coffee trees as a proxy for material assets. It was found that Material assets had a moderating effect on the relationship between the institutional framework and economic benefits in both the certified and Non-certified Coffee Cooperatives, but had no moderating effect in Coffee Estates. It was also found that Material Assets had a negative relationship to Economic Benefits in the Certified Coffee Cooperatives, meaning that

Economic Benefits reduced with a higher number of trees. This could be explained by the attendant costs of labour and inputs.

Kamau *et al* (2011) in their study to estimate the impact of UTZ certification on the welfare of coffee farming households found that it included increased incomes from other crop enterprises or off-farm activities and increased investments on land. Conversely, Nkurunziza (2014) in their study in Rwanda found that off-farm income positively influenced farmers' decision to participate in coffee cooperatives. Monroy, Mulinge and Witwer (2013) noted that farm level prices were much lower for small-scale farmers compared to the estates. Sharma, Pandit, White and Polyakov (2015) found that the households of smallholder coffee producers derived a higher share of their income from off-farm sources than from farm sources. This study used an alternate source of income besides coffee income as a proxy for Financial Assets. It was found that Financial Assets had a significant moderating effect in the Certified Coffee Cooperatives and Coffee Estates but not in the Non-certified Coffee Cooperatives.

The Capability Approach (CA) explains the moderating effect of farmer agency between the Institutional Framework and Economic Benefits. Human Capital Assets for example had a significant moderating effect in all Producer Institutional Arrangements, while Material Assets, Financial Assets, Organizational Assets and Psychological Assets had a moderating effect in at least two of the three Producer Institutional Arrangements. This is explained by Alkire (2005) who stated that for the purposes of CA, agency primarily refers to a person's role as a member of society, with the ability to participate in economic, social and political actions.

The New Institutional Economics (NIE) theory explains the differing outcome of the moderating role of agency among the institutional arrangements. While all the assets had a moderating effect in the Certified Coffee Cooperatives, only Human Capital Assets and Material Assets moderated the relationship between the Institutional Framework and Economic Benefits in Non-certified Coffee Cooperatives. This pointed to institutional constraints in the Non-certified Coffee Cooperatives, whereby Financial, Organizational and Psychological Assets of farmers did not moderate the relationship between the Institutional Framework and Economic Benefits. In both the

Certified and Coffee Non-Certified Cooperatives, Material Assets reduced Economic Benefits. This can be explained by the Transaction Cost Economic theory (TCE) whereby an increase in material assets resulted in an increase in transaction costs. This was the case since the proxy for material assets was the number of coffee trees, which meant higher costs in terms of labour, inputs and other operational costs.

The findings of the study therefore showed that there was a difference in the institutional framework of producer arrangements and in their economic benefits to farmers. Among the three producer arrangements, Coffee Estates had the highest mean income, which was the indicator for economic benefits. An analysis of the institutional framework of the producer arrangements showed that the institutional framework of the Certified Coffee Cooperatives had the highest effect on economic benefits compared to the Non-certified Coffee Cooperatives and the Coffee Estates. The findings of the study therefore make a strong case for certification and further informs this by detailing the benefits and challenges of certification as detailed by coffee farmers and key-informants.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents a summary of the study as guided by the specific objectives, derives conclusions from this summary and gives recommendations based on this. The recommendations include suggestions of further research.

#### **5.2 Summary of Findings**

This impetus for this study was the unifocus on cooperatives in the study of Producer Institutional Arrangements in the coffee sector and a lack of distinguishing between coffee cooperatives. The general objective of this study was therefore to analyze the relationship between Producer Institutional Arrangements in the coffee sector and their effect on economic benefits to farmers. The three specific objectives included characterizing the Producer Institutional Arrangements, determining the relationship between the institutional framework of the producer arrangements and economic benefits, and establishing the extent to which farmer agency moderated this relationship. The institutional framework, farmer agency and economic benefits were the independent, moderating and dependent variable respectively.

The aim of the first objective which was characterizing the Producer Institutional Arrangements was to enable an analysis of the relationship between the institutional arrangements and economic benefits. The study found that the producer arrangements varied in terms of the membership numbers and the number of factories in the cooperative. The processes of the coffee chain differed between cooperatives and estates in terms of farmer engagement. In the cooperatives, the

farmers' role ended at the factory when they delivered coffee to the factory, while estate farmers took on the additional activity of pulping the coffee. While some challenges were specific to the producer arrangement, others were reported across all arrangements and included expensive inputs, lack of transparency in the milling and marketing process and fluctuating coffee prices. Farmers from certified cooperatives reported benefitting more from cooperative membership compared to their counterparts in the non-certified cooperatives. While it was found that certification had several benefits, there were challenges to acquiring and maintaining certification, particularly in regards to the cost of obtaining and renewing certification.

The second objective of the study was to determine if there was a relationship between the institutional framework and economic benefits. It was determined that there was a significant relationship between the Producer Institutional Framework and Economic Benefits in all three Producer Institutional Arrangements. A significant regression equation was found in the relationship between the Institutional Framework and Economic Benefits for each Producer Institutional Arrangement. It was found that the Ability to Choose, Decide and Hold Accountable was significant for the Certified Coffee Cooperatives and had a positive relationship to Economic Benefits. The Ability to Negotiate was significant for the Certified Coffee Cooperatives and Non-certified Coffee Cooperatives and had a negative relationship to Economic Benefits. Access to Industry Information was not a significant predictor of Economic Benefits in any of the Producer Institutional Arrangements. Access to Productive Inputs was a significant predictor in all the arrangements and also had a negative relationship to Economic Benefits in all the arrangements. Access to Health and Education Benefits was also significant for all arrangements and had a positive relationship to Economic Benefits in all the arrangements.

The third objective of the study was to establish the extent to which farmer agency moderated the relationship between the institutional framework and economic benefits. It was established that farmer agency moderated this relationship in all the

Producer Institutional Arrangements. Farmer agency had five components which were Human Capital Assets, Material Assets, Financial Assets, Organizational Assets and Psychological Assets. All these had a significant moderating effect on the Certified Coffee Cooperatives. However among the Non-certified Coffee Cooperatives, only Human Capital Assets and Material Assets had a significant moderating effect. Among the Coffee Estates, all moderating variables had a significant effect except Material Assets.

The findings of this study are consistent with the tenets of the theories used. The findings support the precept of the NIE theory that institutions are an essential element of economics. The study found that the producer arrangements had an effect on economic benefits to farmers and that this varied based on the producer arrangement. Farmer agency moderated the relationship between the institutional framework and economic benefits dissimilarly across the producer arrangements, illustrating that farmer agency can be facilitated or constrained by institutional framework of the producer arrangement the farmer engaged in. The findings also demonstrated the principles of the TCE theory. Access to productive inputs reduced economic benefits in all three producer arrangements, with this reduction being highest in the Coffee Estates and lowest in the Certified Coffee Cooperatives. The costs involved in accessing productive inputs were therefore high in the Coffee Estates as compared to cooperatives, and higher in Non-certified Coffee Cooperatives as compared to the certified cooperatives.

The Ability to Negotiate reduced economic benefits in the cooperatives with the reduction being higher in the non-certified cooperatives, but had no significant relationship to economic benefits in Coffee Estates. This reduction in economic benefits was higher in the Non-certified Coffee Cooperatives. This depicts higher transaction costs involved in negotiating with management, millers and marketers in the non-certified cooperatives. The Ability to Choose, Decide and Hold Accountable resulted in higher economic benefits in Certified Coffee Cooperatives but was not significant in the non-certified cooperatives or in Coffee Estates. The Ability to

Negotiate resulted in lowered economic benefits in both certified and non-certified cooperatives but was less so in the certified cooperatives. Access to Productive Inputs reduced economic benefits in all Producer Institutional Arrangements but this reduction was least in certified cooperatives and highest in the non-certified cooperatives. Access to Health and Education benefits also resulted in higher economic benefits for Certified Coffee Cooperatives than on the Non-certified Coffee Cooperatives and the Coffee Estates.

Based on these findings, the TCE illustrates that transactions costs are lowest in the Certified Coffee Cooperatives compared to either the non-certified cooperatives and Coffee Estates. The Capability Approach was instrumental in interpreting the moderating influence of farmer agency. Farmer agency had a significant moderating effect in the relationship between the institutional framework and economic benefits in all the producer arrangements. Farmer agency explained the variance in economic benefits by an additional 19.9 per cent in the Certified Coffee Cooperatives, 10.6 per cent in the Non-certified Coffee Cooperatives and 13 per cent in the Coffee Estates. These findings demonstrate that within the institutional framework of Certified Coffee Cooperatives, farmer agency has the highest impact on economic benefits, while it has the least impact on non-certified cooperatives. The study therefore contributes to research methodology in terms of measuring the institutional framework of producer arrangements. The study also contributes to development studies through policy and practice recommendation. These include the facilitation of certification in the Non-certified Coffee Cooperatives and in the Coffee Estates, the use of contracts in production and marketing of coffee, and the implementation of transparency and accountability measures in the coffee chain activities and transactions, so as to minimize transaction costs. Amendments to the Cooperative Act were also recommended so as to empower the role of the secretary-manager of cooperatives.

### **5.3 Conclusion**

This study determined that producer arrangements played an essential role in the coffee sector in Kenya. There were similarities and differences between the three Producer Institutional Arrangements: Certified Coffee Cooperatives, Non-certified Coffee Cooperatives and Coffee Estates. In all the arrangements, males comprised the majority of respondents and the 50-59 age group had the highest number of respondents. The institutional framework however differed, with cooperatives being formed and regulated by government under the Cooperatives Act while estate licenses were obtained from the Coffee Directorate. The institutional framework of certified and non-certified cooperatives differed in terms of the regulations in place to ensure the observation of the labour, quality and environmental standards required to obtain and maintain certification.

It was determined that there was a relationship between the Producer Institutional Arrangement and economic benefits to farmers. The effect of the Producer Institutional Arrangement on economic benefits however differed between the three producer arrangements. The study therefore concluded that the institutional framework of Certified Coffee Cooperatives had the highest effect on economic benefits to coffee farmers as compared to Non-certified Coffee Cooperatives and Coffee Estates. Farmer agency as a moderator in the relationship between the institutional framework and economic benefits had the highest impact in certified cooperatives where it explained a higher percentage of the variance in economic benefits compared to the non-certified cooperatives and Coffee Estates. All the assets comprising Farmer Agency had a moderating effect on the relationship between the Institutional Framework and Economic Benefits in the Certified Coffee Cooperatives.

#### **5.4 Recommendations**

Based on the findings of the study, several recommendations were given to enhance farmer empowerment. At the farm level, it was recommended that contract farming be permitted for cooperatives as well as estates. This would entail aspects such as provision of inputs in return for guaranteed sales of a specified quality and quantity. It was also recommended that differentiation of quality at the farm level be instituted in both the Certified and the Non-Certified Cooperatives, coupled with payment commensurate with quality. This could be instituted through the inclusion of such a requirement in the cooperative by-laws, following discussion and acceptance of such measures by the farmers. At the cooperative level, it was recommended that the role of the secretary-manager be reviewed so that they are empowered to exercise the right to veto management decisions.

As pertains to marketing, it was recommended that the government intervene in coffee marketing through the institution of a guaranteed minimum price and a revolving fund to cushion farmers from price volatility. Alternative marketing methods such as online sales should also be facilitated so as to reduce transaction costs and partnerships forged with established international brands. The sale of parchment at the factory level should also be allowed for those willing to engage in factory level sales, whereby the buyer would shoulder the market risk but also gain from favourable coffee prices.

To counter the challenges to certification identified in this study, it was recommended that the government facilitate certification by include subsidizing the initial cost of certification and facilitating adherence to labour and environmental standards. The Coffee Directorate should facilitate the collaboration of estates to enable certification through acting as an arbitrator in case of disputes and to enforce agreements made. To counter the lack of transparency and accountability it was recommended that observation of coffee chain processes and transactions by farmers or their representatives be facilitated. It was also recommended that certification schemes be cognizant of the challenges in the coffee chain that pertain to issues of transparency and accountability. This study identified areas of further study

regarding farmer empowerment within the coffee sector. The first is a comparative study of various coffee certifications to establish the benefits to farmers. The second is a study of operational expenses in all the institutional arrangements, so as to identify areas of inefficiency that lower the payout rate.

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## APPENDICES

### APPENDIX I : QUESTIONNAIRE - COOPERATIVE COFFEE FARMER

My name is Alice Nyawira Okech from Jomo Kenyatta University of Agriculture and Technology (JKUAT) and I am conducting a research on coffee farmers' institutional arrangements in Nyeri County and how these arrangements relate to economic benefits to farmers. All information provided will be treated with utmost confidentiality and your name will not be identified in the final report. Kindly respond to all questions.

#### 1.0 Survey Quality Control

Date of interview	
Start time	
End time	
Enumerator	

#### PART ONE

##### 1.1 Demographics

1.1.1	Name of respondent	
1.1.2	Gender	1=Male [    ]    2=Female [    ]
1.1.3	Age	

##### 1.2 Institutional Arrangement

1.2.1	Cooperative name	
1.2.1.1	Factory name	
1.2.2	Member number	
1.2.2.1	Telephone number	
1.2.3	Sub-county	

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**PART TWO**

**2.1 Preliminary Information**

2.1.1 When was this farm established? [      ]

2.1.2 Who manages the coffee farm?

1 = Owner [    ] From \_\_\_\_\_ (year)

2 = Family member(s) [    ] From \_\_\_\_\_ (year)

3 = Employee [    ] From \_\_\_\_\_ (year)

4 = Management agent [    ] From \_\_\_\_\_ (year)

2.1.3 How long have you been a member of the current cooperative? [      ]

2.1.4 Have you been a member of another co-operative in the last three years?

Yes [    ] No [    ]

2.1.4.1 If yes, kindly indicate cooperative(s) and year(s) of membership \_\_\_\_\_

2.1.4.2 Was changing cooperatives beneficial? Yes [    ] No [    ]

Kindly elaborate: \_\_\_\_\_

**PART THREE**

**3.1 Empowerment Levels**

**3.1.1 Ability to Choose, Decide and Hold Accountable**

Kindly answer the following questions.

	Question	Yes	No
1.	Do you participate in the cooperative society Annual General Meetings (AGMs)		
2.	Do you participate in the elections of cooperative leadership?		
3.	Do you know what is required to vie for leadership?		
4.	Do you agree with these requirements?		

5.	Can you hold accountable the cooperative management committee?		
6.	Have you ever held the cooperative management committee accountable?		
7.	Cooperative management committee is:	1 = Effective [    ] 2 = Moderately effective [    ] 3 = Not effective [    ]	
15.	Do you understand how the coffee miller is chosen?		
16.	Do you agree with the method of choosing the coffee miller?		
17.	Can you participate in choosing a coffee miller?		
18.	Have you ever participated in choosing a coffee miller?		
19.	Can you hold accountable the coffee miller?		
20.	Have you ever held accountable the coffee miller?		
21.	Do you understand how the coffee marketer/marketing agent is chosen?		
22.	Do you agree with the method of choosing a marketer/marketing agent?		
23.	Can you participate in choosing a coffee marketer/marketing agent?		
24.	Have you ever participated in choosing a coffee marketer/marketing agent?		
25.	Can you hold accountable the coffee marketer/marketing agent?		
26.	Have you ever held accountable the coffee marketer/marketing agent?		
27.	Do you understand how coffee is sold?		
28.	Do you agree with the method(s) of selling coffee?		
29.	Can you participate in choosing a coffee buyer?		
30.	Have you ever participated in choosing a coffee buyer?		
31.	Can you hold accountable the coffee buyer?		
32.	Have you ever held accountable a coffee buyer?		

### 3.1.2 Ability to Negotiate

Kindly answer the following questions.

	Question	Yes	No
1.	Can you participate in negotiating costs with the coffee miller?		
	1.1 If yes, have you participated in negotiations with the coffee miller?		
2.	Can you participate in negotiating costs with the coffee marketer/marketing agent?		
	2.1 If yes, have you participated in negotiations with the marketer/marketing agent?		
3.	Can you participate in negotiating coffee prices with the buyer?		
	3.1 If yes, have you participated in negotiating coffee prices with the buyer?		

### 3.1.3 Access to Industry Information

Kindly answer the following questions.

	Question	Yes	No
1.	Do you have access to adequate information about coffee husbandry?		
2.	Do you receive information regarding the quality of your coffee?		
3.	Do you know who the coffee miller is?		
4.	Do you understand how coffee is graded? (e.g. AA, AB, PB, E)		
5.	Do you know who the coffee marketer is?		
6.	Do you understand how coffee is categorized in classes? (e.g. Class 1 to 10)		
7.	Do you know who buys the coffee?		
8.	Do you know at what price the coffee is sold?		
9.	Do you understand how coffee prices are determined?		
	<i>9.1 If yes, these include:</i> _____		
10.	Do you have access to information on the rules and regulations governing the coffee industry		
11.	Kindly indicate main source of information on the coffee industry: _____		

### 3.1.4 Access to Productive Inputs

Kindly answer the following questions.

	Question	Yes	No
1.	Do you receive agricultural extension? (information and demonstration on coffee husbandry)		
1.1	Is the agricultural extension received adequate?		
1.2	Is the agricultural extension received affordable?		
1.3	Is agricultural extension received in a timely manner?		
1.4	Kindly indicate main source of agricultural extension: _____		
2.	Do you require credit for coffee production?		
2.1	Do you have adequate credit for coffee production?		
2.2	Is the credit received affordable? (interest rates, repayment period, terms of payment)		
2.3	Is credit received in a timely manner?		
2.4	Kindly indicate main source of credit for coffee production _____		
3.	Do you have adequate inputs for coffee production?		
3.1	Are the inputs affordable?		
3.2	Are inputs received in a timely manner?		
3.3	Kindly indicate main source of inputs _____		
4.	Do you have adequate tools for coffee production?		
4.1	Are the tools affordable?		
4.2.	Kindly indicate main source of tools _____		
5.	Is your coffee insured?		
	5.1 If yes, do you know who the insurer is?		
6.	During the most recent season, the duration between cherry delivery and payment was: _____		
6.1	Do you find this duration acceptable?		
7	Is your coffee produced under any certification label? (e.g. Fair Trade, Rainforest, Utz, 4C) 7.1 If yes, indicate certification(s) and what it requires _____		

	<p>7.2 Has certification been economically beneficial?</p> <p>Kindly explain: _____</p>		
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### 3.1.5 Access to Health and Education Benefits

1. Do you receive assistance for education or health through the coffee cooperative?

Yes [ ] No [ ]

If yes, kindly indicate type of assistance and the source: \_\_\_\_\_

## PART FOUR

### 4.1 Farmer agency

#### 4.1.1 Psychological Assets

1. The coffee sector in Kenya is:

1 = Improving [ ]

2 = Stagnant [ ]

3 = Declining [ ]

2. What are your plans for coffee production in the next three years?

1 = Increase production [ ]

2 = Maintain current production [ ]

3 = Decrease or discontinue production [ ]

3. How confident are you of your ability to increase yields?

1 = Very confident [ ]

2 = Moderately confident [ ]

3 = Not confident [ ]

4. How confident are you of your ability to improve quality?

1 = Very confident [ ]

2 = Moderately confident [ ]

3 = Not confident [ ]

5. Would you consider opting out of cooperative membership to engage in estate farming if you had the required acreage/number of trees?

1 = Yes [  ] Explain\_\_\_\_\_

2 = No [  ] Explain\_\_\_\_\_

3 = Not sure [  ] Explain\_\_\_\_\_

#### 4.1.2 Organizational Assets

1. How much do you benefit from being a member of a coffee cooperative?

1 = A lot [  ]

2 = Moderately [  ]

3 = Not at all [  ]

2. Are you a member of a financial self-help group (table-banking/chama)?

1 = Yes [  ] 2 = No [  ]

2.1 If yes, to what extent does the coffee production benefit directly or indirectly from you being a member of this group(s)?

1 = A lot [  ]

2 = Moderately [  ]

3 = Not at all [  ]

#### 4.1.3 Material Assets

1. How many acres is the coffee farm? [  ]

2. How many coffee trees are there? [  ]

3. In the last three years, have you:

1 = Increased the number of coffee trees [  ]

2 = Maintained the same number of coffee trees [  ]

3 = Reduced the number of coffee trees [  ]

4. What cultivars/variety of coffee is on the farm? (Please tick all that apply)

1 = Batian [  ]

2 = Ruiru 11 [  ]

3 = SL 24 [  ]

4 = SL 38 [ ]

5 = Other [ ] Please specify \_\_\_\_\_

5. Of the above varieties, which is the predominant one?

1 [ ]      2 [ ]      3 [ ]      4 [ ]      5 [ ]

#### 4.1.4 Financial Assets

1. Do you have another source of income besides coffee farming?

1 = Yes [ ]    2 = No [ ]

2. If yes, is the other source of income:

1 = More than the income from coffee [ ]

2 = About the same as the income from coffee [ ]

3 = Less than the income from coffee [ ]

#### 4.1.5 Human Capital Assets

	Question	No. of years
1.	How many years of schooling does coffee farm owner have?	
2.	How long has coffee farm owner been engaged in coffee farming?	
3.	How many years of schooling does coffee farm manager have?	
4.	How long has coffee farm manager been engaged in coffee farm management?	

### PART FIVE

#### 5.1 Coffee Income

Kindly indicate your production and the amount/kg that you received.

Year	Coffee production	Price/kg	Coffee
------	-------------------	----------	--------

			Income
2015/2016	Kgs.	_____	_____
	Cherry	_____	_____
	Mbuni	_____	

## PART SIX

### 6.1 Conclusion

1. What are your reasons for engaging in coffee production?

\_\_\_\_\_

\_\_\_\_\_

2. What are the challenges you face in coffee farming?

\_\_\_\_\_

\_\_\_\_\_

3. What recommendations would you propose to these challenges?

\_\_\_\_\_

\_\_\_\_\_

4. Who do you think can contribute most to changing the coffee sector?

1 = Self [    ]

2 = Cooperative [    ]

3 = County government [    ]

4 = National government [    ]

5 = Other: \_\_\_\_\_ [    ]

Contacts:

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Phone number: \_\_\_\_\_

Convenient time to call: \_\_\_\_\_

Thank you for taking part in this study.

## APPENDIX II: QUESTIONNAIRE – COFFEE ESTATE FARMER

My name is Alice Nyawira Okech from Jomo Kenyatta University of Agriculture and Technology (JKUAT) and I am conducting a research on coffee farmer institutional arrangements in Nyeri County and how these arrangements relate to economic benefits of farmers. All information provided will be treated with utmost confidentiality and your name will not be identified in the final report. Kindly respond to all questions.

### 1.0 Survey quality control

Date of interview	
Start time	
End time	
Enumerator	

## PART ONE

### 1.1 Demographics

1.1.1	Name of respondent	
1.1.2	Gender	1=Male 2=Female
1.1.3	Age	

### 1.2 Institutional Arrangement

1.2.1	Estate name	
1.2.2	License number	
1.2.2.1	Telephone number	

1.2.3	Sub-county	

**PART TWO: INFORMATION**

**2.1 Preliminary Information**

2.1.1 When was this farm established? [      ]

2.1.2 Who manages the coffee estate?

1 = Owner [    ] From \_\_\_\_\_ (year)

2 = Family member(s) [    ] From \_\_\_\_\_ (year)

3 = Employee [    ] From \_\_\_\_\_ (year)

4 = Management agent [    ] From \_\_\_\_\_ (year)

2.1.3 Has estate owner ever been a member of a co-operative?

1 = Yes [    ]      2 = No [    ]

2.1.3.1 If yes, kindly indicate:

Cooperative(s): \_\_\_\_\_ Year(s): \_\_\_\_\_

2.1.4 What informed your decision to produce as an estate as compared to being in a cooperative?

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**PART THREE**

**3.1 Empowerment levels**

**3.1.1 Ability to Choose, Decide and Hold Accountable**

Kindly answer the following questions.

	Question	Ye	N
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		s	o
1.	Have you ever chosen a coffee marketer who is not affiliated with your miller?		
2.	Have you ever independently verified the coffee grade?		
3.	Have you ever independently verified the coffee class?		
4.	What do you consider when choosing a coffee miller? _____		
5.	Who has your miller been for the last three years? _____		
6.	The coffee miller is: 1 = Effective 2 = Moderately effective 3 = Not effective		
7.	Can you hold the coffee miller accountable? Kindly elaborate: _____		
8.	Have you ever held the coffee miller accountable?		
9.	What do you consider when choosing a coffee marketer/marketing agent? _____		
10.	Who has your marketing agent been for the last three years? _____		
11.	The coffee marketer/marketing agent is: 1 = Effective 2 = Moderately effective 3 = Not effective		
12.	Can you hold the coffee marketer/marketing agent accountable?		
13.	Have you ever held the coffee marketer accountable?		
14.	Can you hold the coffee buyer accountable?		
15.	Have you ever held the coffee buyer accountable?		

### 3.1.2 Ability to Negotiate

Kindly answer the following questions.

	Question	Yes	No
1.	Can you negotiate costs or terms of engagement with the coffee		

	miller?		
	1.1 If yes, have you ever negotiated costs or terms of engagement with the coffee miller?		
2.	Can you negotiate costs or terms of engagement with the marketer/marketing agent?		
	2.1 If yes, have you ever negotiated costs or terms of engagement with the marketer/marketing agent?		
	2.2 Can you specify the time that the coffee should be sold?		
	2.3 Can you specify the price the coffee should be sold at?		

### 3.1.3 Access to Industry Information

Kindly answer the following questions.

	Question	Yes	No
1.	Do you have access to information on the rules and regulations governing the coffee industry?		
2.	Kindly indicate main source of information on the coffee industry: _____		
3.	Do you have access to adequate information about coffee milling?		
4.	Do you receive adequate information on coffee grades?		
5.	Do you understand how coffee is graded?		
6.	Do you receive a report on milling losses		
7.	If yes, what were the milling losses in last three years: <i>(for premium grades if cannot remember others)</i> 2015/2016: _____ 2014/2015: _____ 2013/2014: _____		
8.	Do you receive a report on the coffee classes?		
9.	Do you understand how coffee is categorized in classes?		
10.	Do you know who buys the coffee?		
11.	Do you know at what price the coffee is sold?		
12.	Do you understand how coffee prices are determined? (what is taken into		

	consideration)		
	12.1 If yes, these include:_____		
13.	Do you have access to adequate information about coffee marketing?		
14.	Do you understand the coffee marketing system?		

### 3.1.4 Access to Productive Inputs

Kindly answer the following questions.

	Question	Yes	No
1.	Do you receive agricultural extension (information and demonstration on coffee production)?		
1.1	Is the agricultural extension received adequate?		
1.2	Is the agricultural extension received affordable?		
1.3	Is agricultural extension received in a timely manner?		
1.4	Kindly indicate the main source of agricultural extension:_____		
2.	Do you require credit for coffee production?		
2.1	Do you have adequate credit for coffee production?		
2.2	Is the credit received affordable (interest rates, repayment period, terms of payment)?		
2.3	Is credit received in a timely manner?		
2.4	Kindly indicate the main source of credit for coffee production:_____		
3.	Does the estate have adequate inputs for coffee production?		
3.1	Are the inputs affordable?		
3.2.	Are inputs received in a timely manner?		
3.3	Kindly indicate the main source of inputs:_____		
4.	Does the estate have adequate tools for coffee production?		
4.1	Are tools affordable?		
5.	Is your coffee insured?		
	5.1 If yes, by _____		
6.	During the last coffee season, the duration between parchment delivery and payment was:		
6.1	Do you find this duration acceptable?		

### 3.1.5 Access to Health and Education Benefits

Do you receive assistance for education or health insurance through the miller, marketer, buyer, certification program etc? Yes [ ] No [ ]

## PART FOUR

### 4.1 Farmer Agency

#### 4.1.1 Psychological Assets

1. The coffee sector in Kenya is:

- 1 = Improving [ ] 2  
2 = Stagnant [ ] 3 =  
Declining [ ]

2. What are the owners' plans for coffee production in the next three years?

- 1 = Increase production [ ]  
2 = Maintain current production [ ]  
3 = Decrease or discontinue production [ ]

3. How confident are you of your ability to increase yields?

- 1 = Very confident [ ]  
2 = Moderately confident [ ]  
3 = Not confident [ ]

4. How confident are you of your ability to improve quality?

- 1 = Very confident [ ]  
2 = Moderately confident [ ]  
3 = Not confident [ ]

5. Would you consider joining a coffee cooperative?

- 1 = Yes [ ] Explain \_\_\_\_\_  
2 = No [ ] Explain \_\_\_\_\_  
3 = Not sure [ ] Explain \_\_\_\_\_

#### 4.1.2 Organizational Assets

1. Are you a member of any organization that engages in coffee production or marketing?

Yes [ ] No [ ]

1.1 If yes, how much do you benefit from being a member of this group?

1 = A lot [ ]

2 = Moderately [ ]

3 = Not at all [ ]

2. Are you a member of a financial self-help group (table banking/chama)?

1=Yes [ ] 2=No [ ]

2.1 If yes, to what extent does the coffee production benefit directly or indirectly from owner being a member of this group(s)?

1 = A lot [ ]

2 = Moderately [ ]

3 = Not at all [ ]

#### 4.1.3 Material Assets

1. How many acres is the coffee farm? [ ]

2. How many coffee trees are there? [ ]

3. In the last three years, have you:

1 = Increased the number of coffee trees [ ]

2 = Maintained the same number of coffee trees [ ]

3 = Reduced the number of coffee trees [ ]

4. What cultivars/variety of coffee is on the farm? (Please tick all that apply)

1 = Batian [ ]

2 = Ruiru 11 [ ]

3 = SL 24 [ ]

4 = SL 38 [ ]

5 = Other [ ] Please specify\_\_\_\_\_

5. Of the above varieties, which is the predominant one?

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

#### 4.1.4 Financial Assets

1. Does owner have another source of income besides coffee farming?

1 = Yes [ ] 2 = No [ ]

2. If yes, is the other source of income:

1 = More than the income from coffee [ ]

2 = About the same as the income from coffee [ ]

3 = Less than the income from coffee [ ]

#### 4.1.5 Human Capital Assets

	Question	No. of years
1.	How many years of schooling does coffee farm owner have?	
2.	How long has coffee farm owner been engaged in coffee farming?	
3.	How many years of schooling does coffee farm manager have?	
4.	How long has coffee farm manager been engaged in coffee farm management?	

### PART FIVE

#### 5.1 Production information

1. Do you access subsidized inputs? Yes [ ] No [ ]

2. Do you collaborate with other estates in the production or marketing of coffee?  
(e.g. in purchasing inputs, combining coffee to make a warrantable lot or marketing the coffee) Yes [ ] No [ ]

3. Do you collaborate/partner with other organizations or individuals either domestic or foreign in coffee production or marketing? Yes [ ] No [ ]

4. Have you ever engaged in direct sales? Yes [ ] No [ ]

4.1 If no, what are the challenges to direct sales?

4.2 If yes, kindly complete section below.

4.2.1 Engaged in direct sales: Year(s) \_\_\_\_\_ and amount (kg) \_\_\_\_\_

4.2.2 How do you source direct buyers? \_\_\_\_\_

4.2.3 How does the auction compare to this method in terms of cost, payout prices, payment duration etc? \_\_\_\_\_

5. Has the estate received certification? Yes [  ] No [  ]

5.1 If **not** certified, what are the challenges to obtaining certification? \_\_\_\_\_

5.2 If yes, kindly complete the section below.

5.2.1 Indicate certification and year(s) of certification: \_\_\_\_\_

5.2.2 What are the requirements of certification? \_\_\_\_\_

5.2.3 What are the benefits of certification? \_\_\_\_\_

5.2.4 What are the challenges of certification? \_\_\_\_\_

5.2.5 Has certification ever been discontinued or suspended?

Yes [  ] No [  ]

5.2.5.1 If yes, kindly explain: \_\_\_\_\_

6. Do you engage in any value addition of coffee? Yes [  ] No [  ]

6.1 If yes, briefly describe the process of value addition, its benefits and its challenges.

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## PART SIX

### **6.1 Estate income and expenditures**

1. What are the estates main expenditures?

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2. How can coffee production be increased?

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3. How can costs be reduced?

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4. How can coffee quality be improved?

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---

5. How can prices be increased?

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6. Among the coffee chain actors, who in your opinion, benefits the most financially?

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### 6.2 Perceptions on coffee chain

Kindly indicate to what extent you agree with the following statements

	Questions	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1.	Coffee grading reports are accurate					
2.	Milling loss reports are accurate					
3.	Coffee class reports are accurate					
4.	Coffee marketing system is transparent					

### 6.3 Coffee income

Kindly indicate your production for the last three years and the amount/kg that you received.

Year	Production	Average payout price	Coffee Income
2014/2015	Total: _____		

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**PART SEVEN**

**7.1 Conclusion**

1. What are your reasons for engaging in coffee production?

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2. What are the challenges you face in coffee farming?

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3. What recommendations would you propose to these challenges?

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4. Who do you think will contribute the most to an improvement in the coffee industry?

1 = Self [    ]

2 = Cooperatives [    ]

3 = County government [    ]

4 = National government [    ]

5 = Other [    ]      Kindly specify: \_\_\_\_\_

Thank you for taking part in this study.

### APPENDIX III: KEY INFORMANT GUIDE

My name is Alice Nyawira Okech from Jomo Kenyatta University of Agriculture and Technology (JKUAT) and I am conducting a research on coffee farmer institutional arrangements in Nyeri County and how these arrangements relate to economic benefits to farmers. All information provided will be treated with utmost confidentiality and your name will not be identified in the final report. Kindly respond to all questions.

#### 1.0 Survey Quality Control

Date of interview	
Start time	
End time	
Enumerator	

#### PART ONE:

##### 1.1 Demographics

1.1.1	Name of respondent	
1.1.2	Gender	1=Male [    ]    2=Female [    ]
1.1.3	Age	
1.1.4	Designation	1= Cooperative Secretary Manager [    ] 2 = Other [    ] _____

##### 1.2 Institutional Arrangement

1.2.1	Cooperative name	
1.2.2	Cooperative Society Number	

1.2.2.1	Telephone number	
1.2.3	Sub-county	

## PART TWO: INFORMATION

### 2.1 Information availability

2.1.1 Kindly indicate information availability on the following:

- 1 = Cooperative member register [    ]
- 2 = Individual coffee farm acreage [    ]
- 3 = Number of coffee trees on individual farms [    ] Total: \_\_\_\_\_
- 4 = Annual production per individual [    ]
- 5 = Individual yields [    ]
- 6 = Society bylaws [    ]
- 7 = Audited accounts for previous three years [    ]

### 2.2 Information on cooperative

1. When was this cooperative registered? [    ]
2. How many factories does this cooperative have? [    ]
3. Was it part of another cooperative? Yes [    ]    No [    ]
  - 3.1 If yes, which cooperative? \_\_\_\_\_
4. Has any cooperative/company splintered from it? Yes [    ]    No [    ]
5. Are any factories operating independently of the cooperative?  
Yes [    ]    No [    ]
6. Who constitutes the cooperative management committee?

7. How long have you been in this position? [    ]    7.1 In coffee sector? [    ]

### 2.3 Information on cooperative membership

1. What are the requirements for membership in this coffee cooperative?  
\_\_\_\_\_
2. How many registered members are in this co-operative?

1 = Male [ ] 2 = Female [ ]

3. How many members are active? 1 = Male [ ] 2 = Female [ ]

4. What has been the membership trend since liberalization?

---

5. What is the generational trend in terms of coffee farm ownership and management?

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6. How many farmers have left the cooperative to engage in estate farming:

2.3.6.1 In last three years? [ ]

2.3.6.2 Since liberalization? [ ]

7. What is the range of number of trees? \_\_\_\_\_ to \_\_\_\_\_?

What is the mode? [ ]

### PART THREE

#### 3.1 Empowerment levels

##### 3.1.1 Ability to Choose, Decide and Hold Accountable

1. What is the procedure for choosing the cooperative management committee?

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2. What are the requirements of a cooperative management committee member?

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3. What are the qualifications required by members to vote for the leadership/management?

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4. What are the qualifications for contributing during Annual General Meetings (AGMs)?

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5. What are the requirements of calling a Special General Meeting (SGM)?

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6. Does the cooperative management undergo any training? Yes [  ] No [  ]

7. If it does, who offers this training?

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8. Are there systems in place to hold the cooperative management accountable?

Yes [  ] No [  ]

Kindly elaborate: \_\_\_\_\_

9. What is the procedure for approving expenditures?

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~~11. Are there systems in place to hold the factory management accountable? Yes [  ] No [  ]~~

12. Are cooperative farmers permitted to change factories within cooperative?

Yes [  ] No [  ]

12.1 If yes, do they do so? Yes [  ] No [  ]

13. What is the procedure for choosing a coffee miller?

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14. Who has the miller been for the last three years?

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15. The coffee miller is:

1 = Effective [  ]

2 = Moderately effective [  ]

3 = Not effective [  ]

16. Is there a way to hold the coffee miller accountable? Yes [  ] No [  ]

Kindly elaborate: \_\_\_\_\_

17. Can cooperative independently verify coffee grade? Yes [  ] No [  ]

Kindly elaborate: \_\_\_\_\_

18. What is the procedure for choosing a coffee marketer/marketing agent?

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---

19. Can you choose a marketer who is independent of the miller?

Yes [  ] No [  ]

20. Who has the coffee marketer/marketing agent been for the last three years?

---

21. The current coffee marketer/marketing agent is:

1 = Effective [  ]

2 = Moderately effective [  ]

3 = Not effective [  ]

22. Can cooperative independently verify coffee class? Yes [  ] No [  ]

22.1 If yes, do they?

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23. Is there a way to hold the marketer/marketing agent accountable?

Yes [  ] No [  ]

Kindly elaborate:

---

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24. What is the procedure for choosing a coffee buyer in the event of direct sales?

---

25. Is there a way to hold the coffee buyer accountable (for direct sales)?

Yes [  ] No [  ]

Kindly elaborate:

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### 3.1.2 Ability to Negotiate

	Question	Yes	No
1.	Can you negotiate costs with the miller?		
	1.1 If yes, have you ever negotiated costs with the coffee miller?		
2.	Can you negotiate costs with the coffee marketer/marketing agent?		
	2.1 Can the cooperative specify an acceptable price for their coffee at the auction?		
	2.2 Can cooperative negotiate the time at which coffee will be sold?		
3.	Can you negotiate prices with the coffee buyer (in direct sales)?		
	If yes, have you ever negotiated prices or terms with the coffee buyer?		

### 3.1.3 Access to Industry Information

	Question	Yes	No
1.	Do you have access to information on the rules and regulations governing the coffee industry?		
2.	Kindly indicate main source of information on the coffee industry:_____		
3.	Does cooperative society have adequate information about coffee milling?		
4.	Does cooperative receive adequate information on coffee grades?		
5.	Do you understand how coffee is graded?		
6.	Do you receive a report on milling losses?		
7.	If yes, what were the milling losses for the last three years?		
7.1	2013/2014_____		
7.2	2014/2015_____		
7.3	2015/2016_____		

8.	Do you receive a report on coffee classes?		
9.	Do you understand how coffee is categorized in classes?		
10.	Do you know who buys the coffee at the auction?		
11.	Do you know at what price the coffee is sold?		
12.	Do you have access to adequate information about coffee marketing?		
13.	Do you understand the coffee marketing system?		
14.	Do you understand how coffee prices are determined? (i.e. what is taken into consideration in determining the price) If yes, these include: _____		

#### 3.1.4 Farmers' productive resources

Kindly indicate whether you agree with the following statements specific to this cooperative

	Question	Yes	No
1.	Do farmers receive agricultural extension?		
	1.1 Is the agricultural extension received adequate?		
	1.2 Is the agricultural extension received affordable?		
	1.3 Is agricultural extension received in a timely manner?		
	1.4 Kindly indicate main source of agricultural extension: _____		
	1.5 Does cooperative utilize a trained agronomist?		
2.1	Do farmers have access to adequate credit for coffee production?		
2.2	Is the credit received affordable? (interest rates, repayment period, terms of payment)		
2.3	Is credit received in a timely manner?		
2.4	Kindly indicate main source of credit for coffee production: _____		
2.5	Are there measures to ensure credit is not diverted to activities other than coffee farming?		
3.1	Do farmers have access to adequate inputs?		
3.2	Are inputs affordable?		
3.3	Are inputs received in a timely manner?		
3.4	Kindly indicate main source of inputs: _____		
3.5	Are there measures to ensure inputs are not diverted to activities other than coffee farming?		
4.1	Do farmers have access to adequate tools?		
4.2	Are tools affordable?		

4.3	Kindly indicate main source of tools: _____		
5.	Is the coffee insured? If yes, by _____		
6.	What was the duration between parchment delivery and payment during the most reasons coffee season? _____		
6.1	Do you find this duration acceptable?		
7.	Has the cooperative society adopted new technologies e.g. in processing, milling.		

### 3.1.5 Access to Health and Education Benefits

Do cooperative members receive assistance for education or health through the cooperative for themselves or dependents? Yes [  ] No [  ]  
If yes, kindly elaborate: \_\_\_\_\_

## PART FOUR

### 4.1 Production information

1. Are inputs subsidized? Yes [  ] No [  ]
2. Do you collaborate/partner with other cooperative societies in purchasing inputs or in other activities? Yes [  ] No [  ]
3. Do you collaborate/partner with other organizations or individuals, either domestic or foreign in coffee production or marketing? Yes [  ] No [  ]

3.1 If yes, kindly elaborate

4. What is done to ensure quality of coffee at the farm level?

\_\_\_\_\_

Has this cooperative ever engaged in direct sales? Yes [  ] No [  ]

5.1 If **no**, what are the challenges to engaging in direct sales?

5.2 If yes, kindly complete section below.

5.2.1 How do you source direct buyers?

5.2.2 How does the auction compare to this method in terms of costs, prices, payment duration etc?

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5.2.3 What are the challenges of direct sales\_\_\_\_\_

6. Has this cooperative received certification? Yes [  ] No [  ]

6.1 If **not** certified, what are the challenges to obtaining certification?\_\_\_\_\_

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6.2 If yes, kindly complete section below

6.2.1 Indicate certification and year(s) of certification\_\_\_\_\_

6.2.2 What are the requirements of certification?

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6.2.3 What are the benefits of certification?\_\_\_\_\_

6.2.4 What are the challenges of Certification?\_\_\_\_\_

6.2.5 Has certification ever been discontinued or suspended?

Yes [  ] No [  ]

6.2.5.1 If yes, kindly explain: \_\_\_\_\_

7. Does the co-operative engage in any value addition of coffee?

Yes [  ] No [  ]

8. How can the current cooperative system be improved to benefit coffee farmers more?

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9. What are your views about other forms of coffee farmer organization besides the cooperative system currently in place? \_\_\_\_\_

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## PART FIVE

5.1 Cooperative income and expenditures

1. Kindly elaborate on the cooperatives expenditures

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2. How can coffee production be increased? \_\_\_\_\_

3. How can costs be reduced?

---

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4. How can coffee quality be improved?

---

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5. How can coffee prices be increased?

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---

6. Is cooperative in debt? Yes [  ] No [  ]

If yes, kindly elaborate: \_\_\_\_\_

7. Among the coffee chain actors, who in your opinion, benefits the most financially?

---

Kindly elaborate:

---

---

## 5.2 Perceptions on coffee chain

Kindly indicate to what extent you agree with the following statements

	Questions	Strongly agree	Agree	Neither agree	Disagree	Strongly disagree
--	-----------	----------------	-------	---------------	----------	-------------------

				nor disagree		
1.	Coffee grading reports are accurate					
2.	Milling loss reports are accurate					
3.	Coffee class reports are accurate					
4.	Coffee marketing system is transparent					

### 5.3 Coffee Income

Year	Coffee Production (kg)	Costs deducted	Payout price/kg (Ksh)
2012/2013		Statutory deductions: _____ Operational costs: _____ Milling: _____ Marketing: _____ Other: _____	
2013/2014		Statutory deductions: _____ Operational costs: _____ Milling: _____ Marketing: _____ Other: _____	
2014/2015		Statutory deductions: _____ Operational costs: _____ Milling: _____ Marketing: _____ Other: _____	

**PART SIX**

**6.1 Conclusion**

1. What are the challenges in the coffee sector?

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2. What challenges do you face in your position as secretary-manager?\_\_\_\_\_

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3. What recommendations would you propose to these challenges?

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4. Who do you think will contribute the most to an improvement in the coffee sector?

1 = Individual farmer [    ]

2 = Cooperative [    ]

3 = County government [    ]

4 = National government [    ]

5 = Other [    ] Kindly specify: \_\_\_\_\_

Thank you for participating in this research.

Contacts:

Address:

Telephone:

## APPENDIX IV: RESULTS OF TESTS OF ASSUMPTION

### 1. Results of a Multicollinearity Test

	Overall		CCC		NCC		CE	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
AC	.727	1.375	.589	1.697	.926	1.079	.703	1.423
AN	.820	1.219	.801	1.248	.706	1.417	.743	1.347
AII	.580	1.725	.585	1.709	.873	1.146	.596	1.678
APR	.641	1.560	.597	1.676	.650	1.538	.540	1.851
ASR	.950	1.053	.896	1.116	.886	1.129	.847	1.181

Survey data, 2017

### . Results of Normality Diagnostic Test

Descriptive statistics						
	Skewness		Kurtosis		Conclusion	
	Statistic	Std. Error	Statistic	Std. Error		
EB distributed	1.531	.167	1.558	0.333	Normally	
IF distributed	-.295	.167	.168	0.333	Normally	
AC distributed	-.014	.167	.493	0.333	Normally	
AN distributed	-1.111	.167	.249	0.333	Normally	
AII distributed	-.056	.167	-.981	0.333	Normally	
APR distributed	-.099	.167	-.102	0.333	Normally	
ASR distributed	-.749	.167	1.364	0.333	Normally	
A distributed	1.836	.167	.334	0.333	Normally	
HCA distributed	.285	.167	1.180	0.333	Normally	
MA distributed	1.355	.167	.857	0.333	Normally	
FA distributed	1.632	.167	1.499	0.333	Normally	
OA	.354	.167	-.461	0.333	Normally	

distributed					
PA	.330	.167	-.468	0.333	Normally
distributed					
Survey data, 2017					

**APPENDIX V: NACOSTI RESEARCH PERMIT**

**THIS IS TO CERTIFY THAT**  
**MS. ALICE NYAWIRA OKECH**  
**of JOMO KENYATTA UNIVERSITY OF**  
**AGRICULTURE AND TECHNOLOGY,**  
**0-10109 Nyeri, has been permitted to**  
**conduct research in Nyeri County**  
**on the topic: INSTITUTIONAL**  
**ARRANGEMENTS AND FARMER**  
**EMPOWERMENT IN THE COFFEE SECTOR**  
**IN KENYA**  
**for the period ending**  
**5th July, 2017.**

**Permit No. : NACOSTI/P/16/89529/11835**  
**Date Of Issue : 6th July, 2016**  
**Fee Received : Ksh 2000**



*Alice Nyawira Okech*  
**Applicant's Signature**

*[Signature]*  
**Director-General**  
**National Commission for Science, Technology & Innovation**