

AFS4FOOD PROJECT, WP2, KENYA.



**SPATIO-TEMPORAL DYNAMICS OF COFFEE ESTATES FARMING
SYSTEM AND LIVELIHOODS CONDITIONS OF WORKERS: A CASE
STUDY OF KIAMBU COUNTY**

FINAL REPORT

Prepared by

Juliet Wainaina

DECEMBER 2013

Supervisors:

Philippe Pédelahore, CIRAD, Montpellier
Kennedy Gitonga, CRF, Kiambu County,
Philippe Vaast, CIRAD-ICRAF, Nairobi

ACKNOWLEDGEMENT

Special gratitude goes to the almighty God for his grace, guidance, providence and wisdom throughout my study. My heartfelt appreciation goes to my supervisors Dr Philippe Pedelahore, Mr Kennedy Gitonga and Dr Philippe Vaast for their support and guidance during the study.

ACRONYMS

AFS	Agro Forestry Systems
CBK	Coffee Board of Kenya
CO-OPs	Co-operatives
CRF	Coffee Research Foundation
KNBS	Kenya National Bureau of Statistics
MOA	Ministry of Agriculture
WP2	World Package two

ABSTRACT

Coffee is a crucial sector in the Kenyan economy, since it's the fifth foreign exchange earner and ensures the livelihood of about 60% of the Kenyan rural population. This study sought to document the spatial and temporal dynamics of coffee estate farming system and livelihood conditions of workers. It analysed the evolution and dynamics of change in terms of land use and agro socio-economic aspects happening in the target zone. The findings were that the land under coffee has gradually reduced from the 1980s to now due to engaging in other more profitable ventures, with the main one being real estate. The real estate business is very profitable in Kiambu County due to the influx of people in the County due to its proximity to Nairobi which is the Capital City and also due to industries and institutions in the County. The second objective was to find out the strategies of owners and managers of coffee estates. It was found out that the majority of estate employees are casuals, which is a strategy use by estate owners to save on cost such as housing, insurance and other allowances that should be accorded to permanent employees as per the government directive. To attract the casual workers they offer incentives such as pasture and firewood, especially during the harvesting season when estates are competing for workers. The estates also transport workers from far off places or villages during the harvesting period to ensure they do not lack labour. The final objective was to characterise the strategies and trajectories of estate employees. The findings were that the workers supplement their income by engaging in other income generating activities like hawking and also subsistent farming for those who have land. The young workers, that is, those in their twenties and early thirties save most of their income so as to start non-farm businesses, with the common one being *boda boda* business, which according to them is more prestigious, less demanding in terms of man power and earns more money, that is, around 500-800 shillings a day.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	
ACRONYMS	
ABSTRACT	
1.0 INTRODUCTION	
1.1 MAP OF KIAMBU COUNTY	
2.1 GENERAL EVOLUTION	
2.2 COOPERATIVES AND ESTATES	
2.3 COFFEE VALUE CHAIN ORGANISATION AND EVOLUTION	
2.3.1 Coffee Factories	
2.3.2 Cooperative Societies	
2.3.3 Co-operatives in Pre- independence Era	
2.3.4 Post- independence but Pre-liberalization Era	
2.3.5 Era of Liberalization, Structural Adjustment and Privatization	
2.3.6 Coffee Pricing	
2.4 PRODUCTION AND ACREAGE TREND	
2.4.1 General Production Data	
2.4.2 Coffee Price-Production Relationship	
2.4.3 Acreage Trend	
2.4.4 Productivity Trend	
2.4.5 Challenges Facing Production and Productivity	
2.4.6 New emerging challenges	
2.6 KIAMBU COUNTY DEMOGRAPHICS	
3.0 DYNAMICS OF CHANGE IN TERMS OF LAND USE IN KIAMBU COUNTY: RESULTS OF ESTATE MANAGERS SURVEY	
3.1 METHODOLOGY: SAMPLING PROCEDURE AND SAMPLE SIZE	Erreur ! Signet no
3.2 RESULTS	
3.2.1 EVOLUTION OF LAND USE	
3.2.2 Area of Estate under Other Activities	
3.2.3 Growth of Real Estate	

3.2.4 Evolution of the Coffee Agroforestry System	
4.0 WORKERS CHARACTERISTICS AND MANAGEMENT	
4.1 Methodology	Erreur ! Signet no
4.2 Results	
4.2.1 Workers Characteristics.....	
4.2.2 Retention of Workers.....	
4.2.3 Workers Age.....	
4.2.4 Percentage Gender Involvement.....	
4.3.5 Workers Pay and Poverty Level	
5.1 Methodology	Erreur ! Signet no
5.2 Results	Erreur ! Signet no
5.2.1 Workers Conditions.....	
5.2.2 Days worked per week	
5.2.3 None Monetary Benefits.....	
5.2.4 Food Insecurity	
5.2.5 Solutions for Food Insecurity	
5.2.6 Expenses per year	
5.2.7 Problem with Cash Income.....	
5.2.8 Solutions Sought for Low Income.....	
5.2.9 Work Preference	
5.2.10 Future Work Plans	
5.2.11 Human and Physical Capital.....	
REFERENCES	

TABLE OF FIGURES

Figure 1: Kenya Coffee production 2005-2010 as per Ministry of Agriculture statistics	
Figure 2: Kenya Coffee Production Trend 1980-2011 as per Coffee Research Foundation statistics.....	
Figure 3: Kenya Coffee Production-Price Relationship Over Time.....	
Figure 4: Kenya Coffee Production and Price Trends as Per Coffee Research Foundation Statistics	
Figure 5: Kenya Acreage Trend.....	

Figure 6: Kenya Coffee Productivity Trend

Figure 7: Area Under Coffee in the 90s and Currently in the Sampled Estates

Figure 8: Area of the Estates under Other Activities

Figure 9: Evolution of Coffee Agroforestry

Figure 10: Percentage of Permanent and Casual Workers.....

Figure 11 :Percentage of permanent and casual workers (based on their number/year)

Figure 12: Problems of Retention of Workers

Figure 13: Workers age categories

Figure 14: Percentage Gender Involvement in Pruning, Spraying and Harvesting

Figure 15: Hours worked per day

Figure 16: Days worked in a week

Figure 17: Non Monetary Benefits by Employers

Figure 18: Food problems

Figure 19: Solutions Sought for Food Insecurity.....

Figure 20: Workers expenses per year.....

Figure 21: Income Related Problems.....

Figure 22: Solutions for low Income

Figure 23: Work Preference.....

Figure 24Future Plans

Figure 25: Education Level of the Workers.....

Figure 26: Physical Capital.....

Figure 27: Land Capital

CHAPTER ONE

1.0 INTRODUCTION

AFS4FOOD is an African Union project financed by the European Union (10th FED). In Kenya (Muranga County and Kiambu County), the project is coordinated by ICRAF in collaboration with CIRAD & CRF. The project entailed; Enhancing food security and well-being of rural African households through improved synergy between food-crops and perennial agroforestry systems and particularly in the Work Package (WP) 2 focusing on: Documenting the spatial and temporal dynamics of agrosystems in target coffee zones of Kenya, Assessing the evolution of farmers' strategies, particularly the contribution of coffee agroforestry systems (AFS) and food crop systems in improving the food security and livelihood of rural communities, Establishing prospective scenarios at farm level and on spatial dynamics of coffee agro forestry systems. In Kiambu which is where this study was carried out the focus was on coffee estates since they are many in the area, while in Muranga the focus was on smallholders.

1.1 OBJECTIVES OF THE STUDY

Characterizing the evolution and dynamics of change in terms of land use and agro-socio-economical aspects that has happened and is happening in the target zone (from the onset of coffee cultivation to a more detailed assessment of the last 30 years).

- 2) Characterization of the strategies of owners and managers of coffee estates.
- 3) Characterize the strategies and trajectories of estate employees.

CHAPTER TWO

LITERATURE REVIEW

2.1 GENERAL EVOLUTION OF THE COFFEE INDUSTRY IN KENYA

The Coffee industry is a very crucial sector to the Kenyan economy. Coffee is a key export earner, being the fifth foreign exchange earner after Tourism, Tea, Horticulture and remittances from Kenyans in the Diaspora. Coffee ensures the livelihood of about 60% of the Kenyan rural population. Coffee cultivation in Kenya dates back to 1893, when fathers of the Congregation of the Holy Spirit brought the first Arabica trees from Ethiopia and planted them in Kiambu district, just north of Nairobi. Coffee was first grown in Kenya at the French Catholic Mission in Bura on the slopes of Taita hills as early as 1885. In 1896, coffee was planted in a mission station in Kibwezi, near Machakos town. However, due to the hot and dry climate, the coffee did not do well.

In the first part of the 20th century the interior, Kenyan interior was occupied by British and European settlers who introduced Coffee in Kiambu-Kikuyu district, a fertile area, which by 1912 boasted plantations several hundred acres in size, growing predominately the Bourbon and Kent varieties. Whilst credit for the introduction of coffee rests with the Missionaries, the settler farmers accelerated its importance to the economy, as they were actively encouraged to grow crops for export in order to help repay the then exorbitant costs of building the railway. To protect their interest the wealthy Europeans banned Kenyans from growing coffee, introduced a hut tax and gave them less and less wages for their labour. The local people were forced to leave their land and go to the cities in order to survive. This legal slavery of the population continued

until the British relinquished control in 1960. Despite the difficult history, Kenyan Coffee has flourished and is among one of the finest cups in the world. After independence, the long acquired expertise experience in coffee production has been well adapted by indigenous Kenyan farmers, resulting in today's high coffee quality which is recognised by coffee drinkers around the world. That original bourbon type is known as French Mission. In the 1950s Scott Laboratories, led by Guy Gibson, developed a number of variations to the strain, numbered SL1 through SL40. The most successful and well-known of these are SL28 and SL34, and they account for the majority of the coffee grown today. While these are bourbon varieties, they are grown in full sun on nearly all farms.

Little further developments have occurred with the coffee variety since the fifties with the exception of Ruiru 11. Differing from the French Mission more than the SL types, Ruiru 11 is a dwarf variety aimed at disease resistance and increased yield. For the past four or five years, however, results have been poor, and Ruiru 11 makes up only two or three percent of the coffee grown in Kenya at present. The coffee sector flourished after independence leading to the famous coffee boom of the 1970s fuelled by International Coffee Organisation's quota system. It has also been through the collapse of the quota system leading to drop in world prices, followed by 1980s liberalisation of the sector, which saw the once vibrant sector on its knees dropping from 130,000 Metric tonnes of coffee to current 52,000 Metric tonnes. Many coffee farmers have thus over the years been subjected to a life of poverty. In recent years various reforms have been instituted in the coffee sector including the enactment of the Coffee Act 2001, Coffee (General) Rules 2002, and the Finance Act of 2008 that were supposed to improve the sector and in turn the incomes of the coffee farmers. However, the last few years have been very difficult for the coffee farmers; they have become more impoverished after the sector suffered due to poor global

prices, unfavourable climatic conditions, mismanagement at co-operative societies, liberalisation of coffee milling and marketing.

2.2 COOPERATIVES AND ESTATES

Kenya's coffee crop is a combination of large estates and smallholders, the proportion is about 75% of the acres in coffee cultivated by some six hundred thousand small growers, accounting for over half the national production. While small farms are said to average 1 to 5 acres, land inheritance laws that require the division of land between offspring each generation has resulted in much smaller farms in some and threatens to make coffee farming unsustainable as a livelihood. The small holders are organised into cooperatives so as to sell their coffee together while the estates sell their coffee individually. Kenyan coffee is sold using the auction system which dates back to 1934 where as the co-operative system was formed after the end of World War II. The coffee subsector in Kenya is organized into coffee factories, farmers' cooperative Societies, District Cooperative Unions and the Kenya Planters Cooperative Union; The coffee Board of Kenya (CBK) is a regulating agency in the coffee subsector (Nyangito 2001)

2.3 COFFEE VALUE CHAIN ORGANISATION AND EVOLUTION

2.3.1 Coffee Factories

Almost all existing coffee factories serving smallholder farmers belong to cooperative societies. A few private factories have started since coffee processing and milling has been liberalized, but they are still rare. Nyangito, 2001 notes that factory management is burdened with nepotism, which has led to mismanagement and run-down facilities a factor that may contribute to

cooperative break-up. In general, factory payout to farmers is largely determined by the charges for the services of coffee processing, storage, bulking and transportation and for overheads. High deductions and lower-quality coffee result in low producer price, which discourages production.

2.3.2 Cooperative Societies

Cooperative societies are wholly formed by a group of factories, but in some cases one factory may make up a society. Main society functions are to keep books, provide credit, market, repair and maintain factories, and employ factory staff. Most societies are poorly managed and this has led to a widespread break-up of large societies into smaller ones. The problem is made worse by huge deductions taken from farmers' returns to cover expenses incurred by the many factories a society may own. The payout from society to factory varies from about 46% to 93% depending on the performance of the cooperative and the services it offers to factories and individual factory expenses. Over 95% of the expenses for factories are factory related, but much of these expenses are inflated because of corrupt practices, such as exaggerated deductions for both factory and the society services (Kegonde, 2005 ; Lindberg, 1993).

2.3.3 Co-operatives in Pre- independence Era

Informal producer organizations have been in existence in Kenya even before colonial period. However, formal organizations particularly cooperatives started as early as 1908 and membership was limited to white settlers. The first cooperative was established at Lumbwa in Rift Valley, in present-day Kipkelion area (Wanyama, 2009). In 1944 colonial officers opened the door for Africans to form and join cooperatives. The Mau Mau rebellion of early 1950s had a negative effect on the cooperative members of staff who withdrew to join pro-

independence forces. However cooperatives continued to grow, the reason for this growth was application of the Swynnerton plan of 1954 on Developing African Agriculture and Improving Land Tenure. By 1958 there were over 400 registered cooperatives (Gamba & Komo 2006).

2.3.4 Post- independence but Pre-liberalization Era

The post independence era saw the rapid rise in number of producer organizations and the consolidation of the ones that already existed. At this time, the government saw the cooperative movement as a vehicle to the introduction of African socialism, and for strengthening common ties between the people from different regions of Kenya (Karanja, 2002). Producer cooperatives were also directly linked to government parastatals. No individual private traders were allowed to compete with cooperatives, these Cooperatives were linked to state run marketing corporations like National Cereals and Produce Board (NCPB), Cotton Board of Kenya (CBK), Pyrethrum Board of Kenya (PBK), Coffee Board of Kenya (CBK), Kenya Meat Commission (KMC), and Kenya Cooperative Creameries (KCC). Most of the cooperative members' produce was sold to these corporations and the latter then linked the cooperatives to the world market. These linkages excluded the participation of private traders in the marketing of the agricultural produce. The direct intervention by the government in management of cooperatives compromised the principles of member owned and run organizations. Government involvement hindered the emergence of member-controlled cooperatives since members relied on government to safeguard their interests. As a result, equality, equity, solidarity, democratic principles, self-responsibility, and self- help that are important pillars of successful producer organizations were thus hindered. This caused the cooperatives to be run as if they were government owned instead of privately owned member organizations (Gamba & Komo 2006).

2.3.5 Era of Liberalization, Structural Adjustment and Privatization

The advent of economic and political liberalization in early 1990's heightened the need for liberating cooperatives from government control. A new policy was consequently formulated by 1997 to provide for a member based, autonomous and member controlled movement. The aim was to enable cooperatives make independent decisions concerning operations of their business and to have a level playing ground like the rest of the private sector. New legislation was also put in place to implement this policy the same year (Karanja, 2002). The liberalization period brought a wind of change in the structure and the running of the cooperatives. Having been fully dependent on the government for the control of markets and funding, it was difficult for them to suddenly start operating on their own. These institutions were not prepared to compete with private firms that brought in high levels of competition (Wanyama, 2009).

The Sessional Paper no.6 of 1997 outlined the government's role as facilitative in nature, that is, Create an enabling environment for cooperatives to operate. The other role was regulatory particularly in the formulation of policies and legislation. This meant no direct involvement in the running of the cooperatives. Liberalization saw the mergers and splits of various cooperative societies. High levels of mismanagement mainly fuelled this, and other factors beyond management's control, like fluctuating market prices. Political influences could not be avoided and some individuals in management used their positions to gain political leverage (Gamba & Kombo 2006). The Cooperative Societies Amendment Bill of 2004 sought to re-introduce some degree of government control. As much as the government would not completely leave the cooperative sector alone without any form of regulation, it explicitly

defined a clear point of intervention without prejudicing its own efforts of embracing the principle of a free market economy.

2.3.6 Coffee Pricing

Facilities and operations of coffee marketing cooperatives are in many ways similar to those of other firms. They must employ resources such as management, labour, and capital. They are Subject to market and competitive factors and to all regulations regarding industries in which they cooperate, including those that affect handling, packing, processing, marketing and transporting products. (Chambo et al, 2008). Pricing may involve differentials or discounts for various grades and hauling charges unless they are listed separately. These factors plus changes in the value of inventories affect the gross margins per dollar or unit realized over various time periods. Pricing at prevailing market levels reduces the likelihood of extreme pricing practices by competitors. It increases the chances for the cooperative to realize net margins and accumulate operating reserves to cushion the effects of market price declines or unusual expenses (Karanja, 2002).

The international coffee market is one of the world's most volatile, exhibiting extreme sensitivity to fluctuations in the supply from a handful of coffee-producing countries. For more than a decade, coffee farmers around the world have been struggling to adapt to exacerbated volatility in supply and prices, precipitated not only by climatic events in the largest producer countries (notably Brazil), but also by important changes in production technology, processing techniques and the structure of inter-national markets (Ponte 2002). Since its introduction as a cash crop in the early 1900s, coffee has traditionally been the backbone of Kenya's rural highlands economy. Coffee was the nation's top foreign exchange earner from independence in 1963 until it was surpassed by tourism in 1989. Since then,

national coffee earnings have steadily declined and currently rank fourth after tourism, tea, and horticulture (Karanja, 2002).

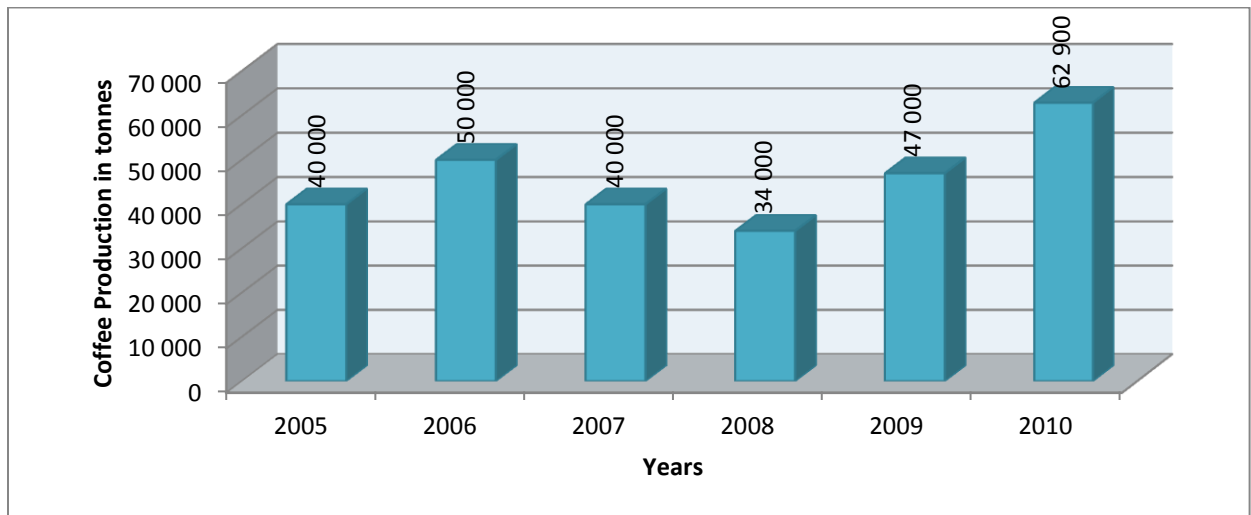
Nyangito, 2001 notes that factory payout to farmers is largely determined by the charges for the services of coffee processing, storage, bulking and transportation and for overheads. High deductions and lower-quality coffee result in low producer price, which discourages production. Milling charges vary from miller to miller but deductions on the farmers' proceeds should not exceed 4% of the export price according to CBK rules. This has restricted the range of services millers can provide. As a result, conflicts have arisen over unfulfilled promises millers have made to farmers (Karanja, 2002).

2.4 PRODUCTION AND ACREAGE TREND

2.4.1 General Production Data

To date several coffee varieties have been developed. There is Batian and Ruiru (Hybrid varieties) and SL varieties. SL varieties range from 1-40 but the most cultivated and successful SL varieties are SL28 and SL34. In 1986, it was projected that by 1999, coffee production would have increased to 354,000 MTs up from 110,000 tonnes something which did not materialize as shown in figure 2. That is, in 1999 only 68, 783 MTs was recorded which is far lower than what was projected. According to MoA statistics, coffee production has since fallen from about 130,000 MTs in 1989 to about 47, 000 MTs in 2009 (figure 1), and the real cause being price fluctuation Price increase is an incentive to produce more and it is evident that the recent increase in coffee prices has increased production to 62, 900 MTs up from 47, 000 MTs (Figure 1).

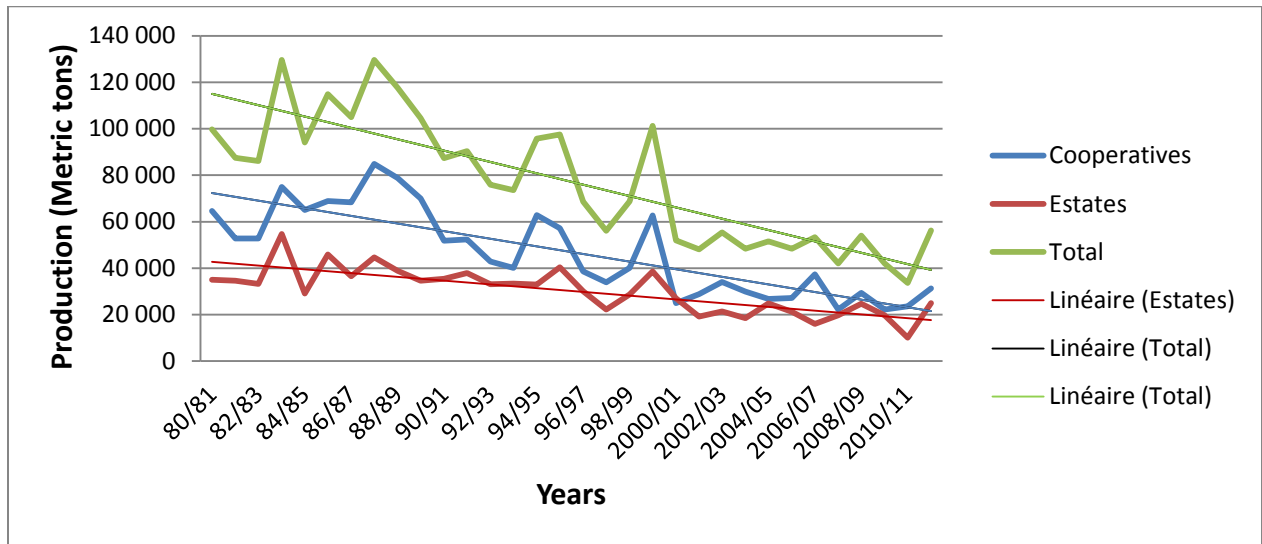
Figure 1: Kenya Coffee production 2005-2010 as per Ministry of Agriculture statistics



Source: MoA, 2011

Production trends for both cooperatives and estates move in the same direction. However total productions for cooperatives is higher than that for estate throughout the three decades. This is explained by differential in acreage under coffee whereby it is higher in cooperatives than estates. Though estates have large tracks of land, they are few.

Figure 2: Kenya Coffee Production Trend 1980-2011 as per Coffee Research Foundation statistics



Source: Coffee Research Foundation

As depicted in figure 2, total coffee productions fell from 99, 717 Metric tonnes (MTs) in 1980 to 86, 064 MTs in 1982. At the same time, cooperative and estate productions also dropped. In 1982, cooperative total productions were 52, 845 MTs down from 64, 627 MTs in 1980. Estates productions moved downwards from 35, 090 MTs in 1980 to 33, 219 MTs in 1982. Between 1987 and 1993, total productions fell from 129, 635 MTs to 73, 516 MTs. Cooperatives production fell from 84, 923 MTs to 40, 143 MTs while that for estates fell from 44, 712 MTs to 33, 373 MTs. Also a drop in coffee production is witnessed between 1999 and 2011. Total production dropped from 101, 289 MTs in 1999 to 33, 633 MTs. Cooperatives production was 62, 641 MTs in 1999 and dropped to 23, 543 MTs in 2011. Estate’s productions were 38, 647 MTs in 1999 and fell to 10, 090 MTs. The fall in production between 2002 and 2010/11 is attributed to “coffee crisis” of 2002 when coffee prices collapsed to their lowest point in real terms for 100 years (NRI, 2006).

The results show that coffee production in Kenya for the last three decades have been decreasing at an increasing rate. That is, between 1980 and 1982 overall, cooperatives and estates productions reduced by 13%, 18.2% and 5.3% respectively. Between 1987 and 1993 it reduced by 43.3%, 52.8% and 25.4% respectively while between 1999 and 2011 it reduced by 66.8%, 62.4% and 73.9% respectively. It is further noted that what was achieved in 1987 (129, 635 MTs) has never been attained to date. Since 1989 (104, 543 MTs), the year 2000 only managed to hit 100, 000 MTs mark. Additionally, what is achieved today (2011) is almost half (56, 258 MTs) what was achieved in 1980 (99, 717 MTs). It is also observed that the duration at which production is falling is longer than the duration the increase in price take to positively affect the production (Figure 2). This shows that the trend is moving downwards and future coffee production is likely to go down further unless more effort is put to eliminate major constraints. The general decline in coffee production from 1987 to 2011 is mainly attributed to price fluctuation and climate change. The effect of these factors and others such as pests and diseases, population pressure and urbanization, political environment, youth factor, gender; on coffee production is discussed elsewhere in this document. Nevertheless, coffee productions has been increasing from 43, 778 MTs in 1963 to 99, 717 MTs in 1980. This is because most of the production resources land and labour were plenty and cheap. Also unlike today, climate and weather and soil fertility was very favourable to coffee production.

2.4.2 Coffee Price-Production Relationship

As reported elsewhere in this study, farmers make production decisions based on prediction and perceived price trend. High coffee prices acts as an incentive to farmers to increase the supply. Therefore in this part we seek to explain why coffee production and prices have been fluctuating for the last three decades as shown in figure 3 and 4. It is reported that since World War II, prices

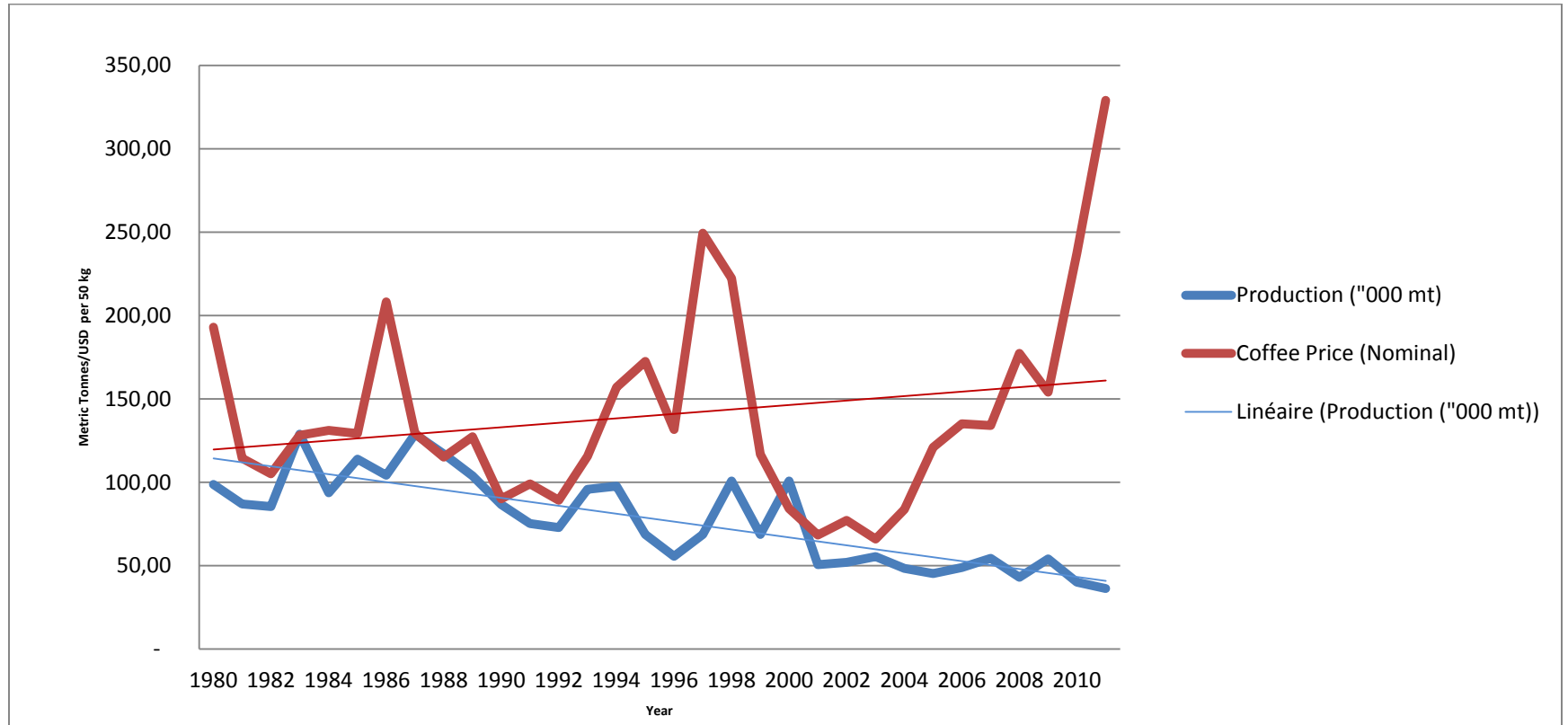
for primary commodities has been declining as compared to those for manufacturing products (Maizel, 1987) which includes prices for coffee. Recently, there came about what is referred to as “Coffee Crisis”. According to Osorio (2002), coffee prices fell to the lowest point in real terms for a century. The prices received by the farmers were so low that could not cover production costs. Despite the crisis, coffee prices have been increasing since 2005 due to high demand in the world Market (Lewin et.al.2004). CRF statistics (Figure 4) also shows that the coffee prices have been increasing for the last three decades. But this is projected to be not long lasting since the prices are highly dependent on supply levels more so from developed nations. Nonetheless, the increases in the prices have been characterized by longer periods of low prices and shorter periods of rise in prices.

It is important to note that despite the increase in the coffee prices production has been declining (Figure 3 and 4). This is because the rise in coffee prices was not sufficient to cover production costs and farmer’s gross margins. This is also compounded by increase in input prices (labour, fertilizers, agrochemicals, seeds/seedlings) thus squeezing out the returns. Most notably is inflation of 1992 and 2010/11 which inflated prices of various farming inputs. Locally coffee prices received by farmers are pushed further to lower levels by low exchange rate, government taxes and deductions by cooperatives and unions.

Many studies have reported structural changes within coffee commodity chain that are responsible for coffee price fluctuation. It is noted that since 1980’s the markets has shifted from governments controlled to liberalized Markets as a result of neo-liberalization (Lewin et.al.2004). Before the markets were liberalized, coffee trade internationally was controlled through Export Quota System something many studies attribute to coffee price Stabilization between 1962-1989. The liberalization of domestic markets as a result of pressure from IMF

and World Bank has since increased the prices paid to farmers. However its short-comings include increased price volatility, constraint access to credit for farmers and involvement of private sector who are responsible for loss of market share for cooperative (Ponte, 2002). Supply and demand in the global market also has since undergone greater changes. For example the expansion of Robusta and Arabica production in Vietnam and Brazil respectively in 1990's at a lower cost reduced the market share for the African states (NRI,2006: Lewin et al. 2004) Kenya inclusive. This means, Brazil and Vietnam could still receive sufficient returns at a smaller drop in coffee prices due to low cost of production per ton.

Figure 3: Kenya Coffee Production-Price Relationship Over Time



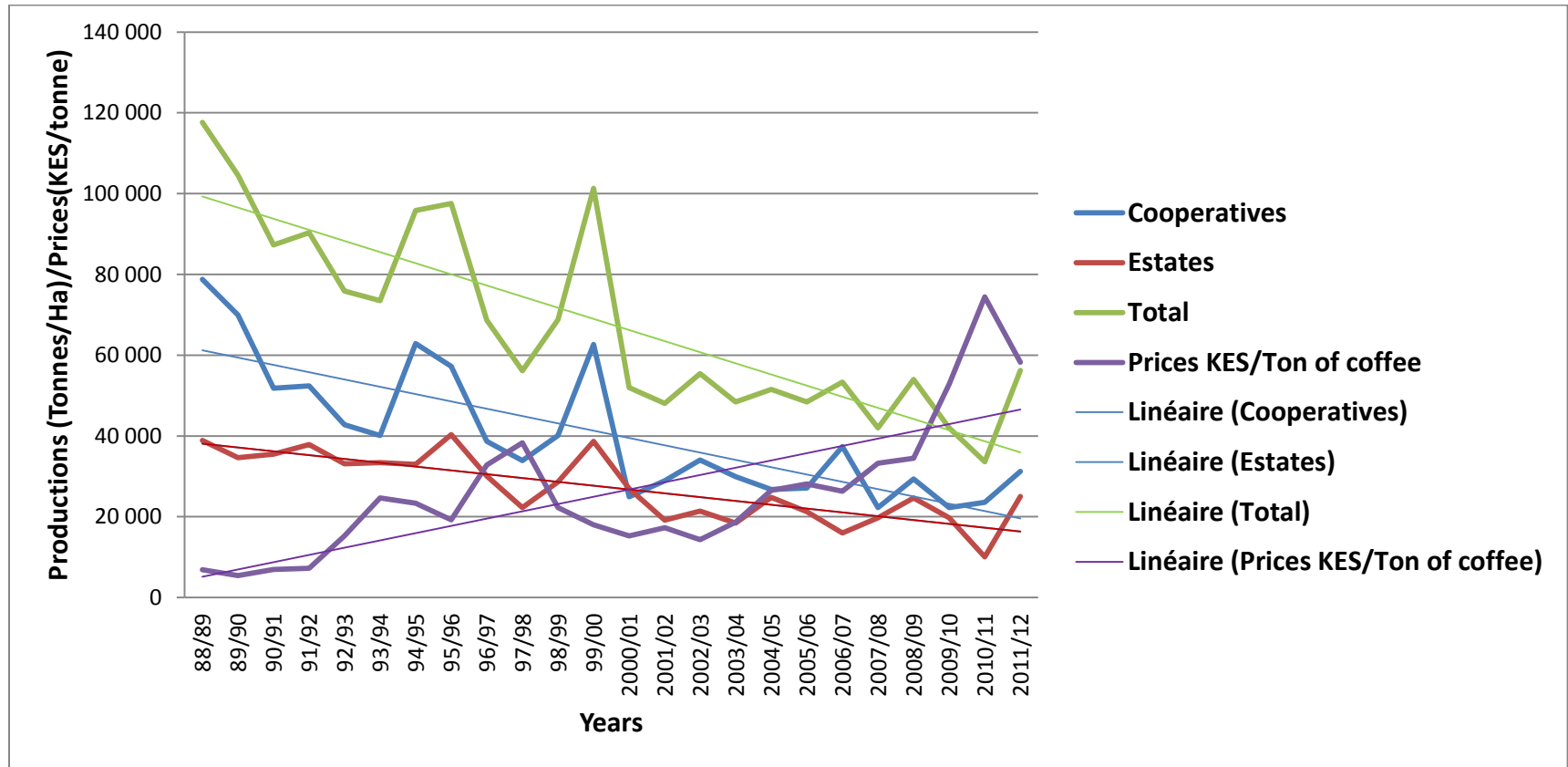
Source: Unknown

In terms of change in market demand, demand for branded products such as specialty coffee, organic fair trade, eco-friendly and decaffeinated coffees has since increased. There is also high demand in the need to trace the origin of product, economic, social and environmental transparency (NRI, 2006). Such demands are costly and thus difficult for developing nations to meet. This means then that if the trend continues to increase market share for developing countries like Kenya will likely to reduce radically. Shift is also seen in coffee roasting and grinding technologies. The changes include steaming and new emerging ways of reducing acidity of Robusta coffees. Such new methods can increase or reduce the quality of coffee and if it can increase the quality then the coffee prices will go up and benefit processors (Scholer, 2004).

The question is that; does the increase in coffee prices in the upper part of the value chain benefit coffee producers? The answer may be no. This is because in the upper part of value chain, traders, roasters and other actors control global coffee markets by dictating the quality attributes of coffee they want and their respective prices (Daviron and Ponte, 2005) and this has resulted to loss of market power by coffee producing countries. There is increasing number of roasters and traders cartels globally. A good example is the existence of fine international coffee trading houses controlling approximately 40% of the green coffee imported worldwide. Also ten roasters control 60-65% of all sales of processed coffee something commonly done under brand names (Scholer, 2004). The outcome of short-term price fluctuation and long term shift in trade terms is what is referred to as “Commodity Problem” whereby change in prices and terms of trade has resulted to low returns and high risks faced by coffee producers and governments that depend on coffee as a source of revenues (DFID, 2004). In summary, structural changes in the global has

resulted to a paradox whereby consuming countries enjoy coffee drinking and its income while producing countries face crisis both at consumption and production levels.

Figure 4: Kenya Coffee Production and Price Trends as Per Coffee Research Foundation Statistics

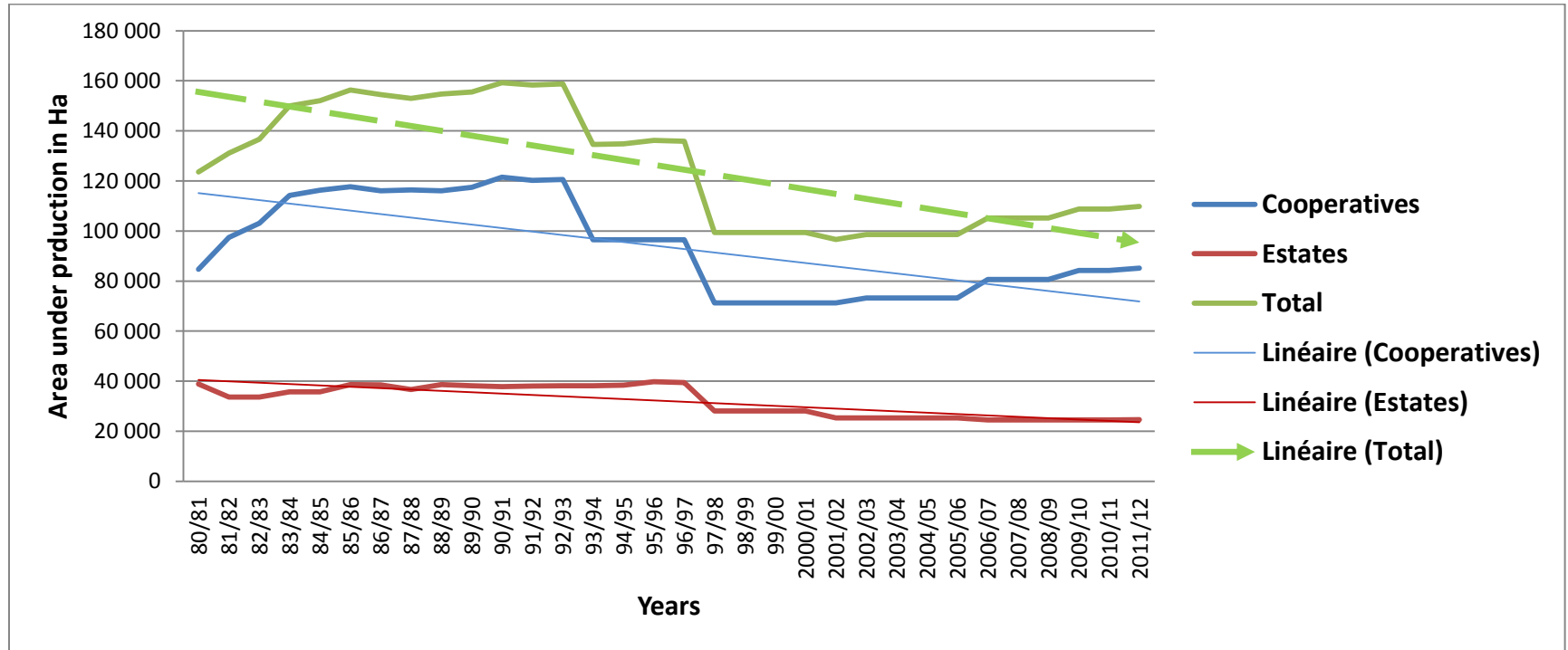


Source: Coffee Research Foundation

2.4.3 Acreage Trend

To obtain current and reliable acreage data, area under coffee for was adjusted by factors derived from recent surveys by CRF to take care of the changes in land use. The acreage under coffee over time is shown in figure 5. It is noted that area under coffee expanded between 1980 and 1985 as a result of increase in prices (Figure 5; Nyoro and Jayne-undated). According to 1982 statistics, small-holder farmers owned an average of 1.33 ha of coffee (Whitaker, 1986). However, acreage trend has been declining since 1991/92 to date as shown in Figure 5. The decline in the acreage under coffee is attributed to the low and fluctuating coffee prices/income received by farmers, population and urbanization pressure, climate and whether changes, population and urbanization pressures. As a result farmers were forced to shift production to other farm enterprises that are profitable and favourable to climate change. The worst hit is coffee estates since 2005 to 2011 whereby as cooperative acreage increases, estate acreage continues to decline as shown in figure 5. This is attributed to the population and urbanization pressure which has increased demand for real estate around Kiambu area.

Figure 5: Kenya Acreage Trend



Source: Coffee Research Foundation

2.4.4 Productivity Trend

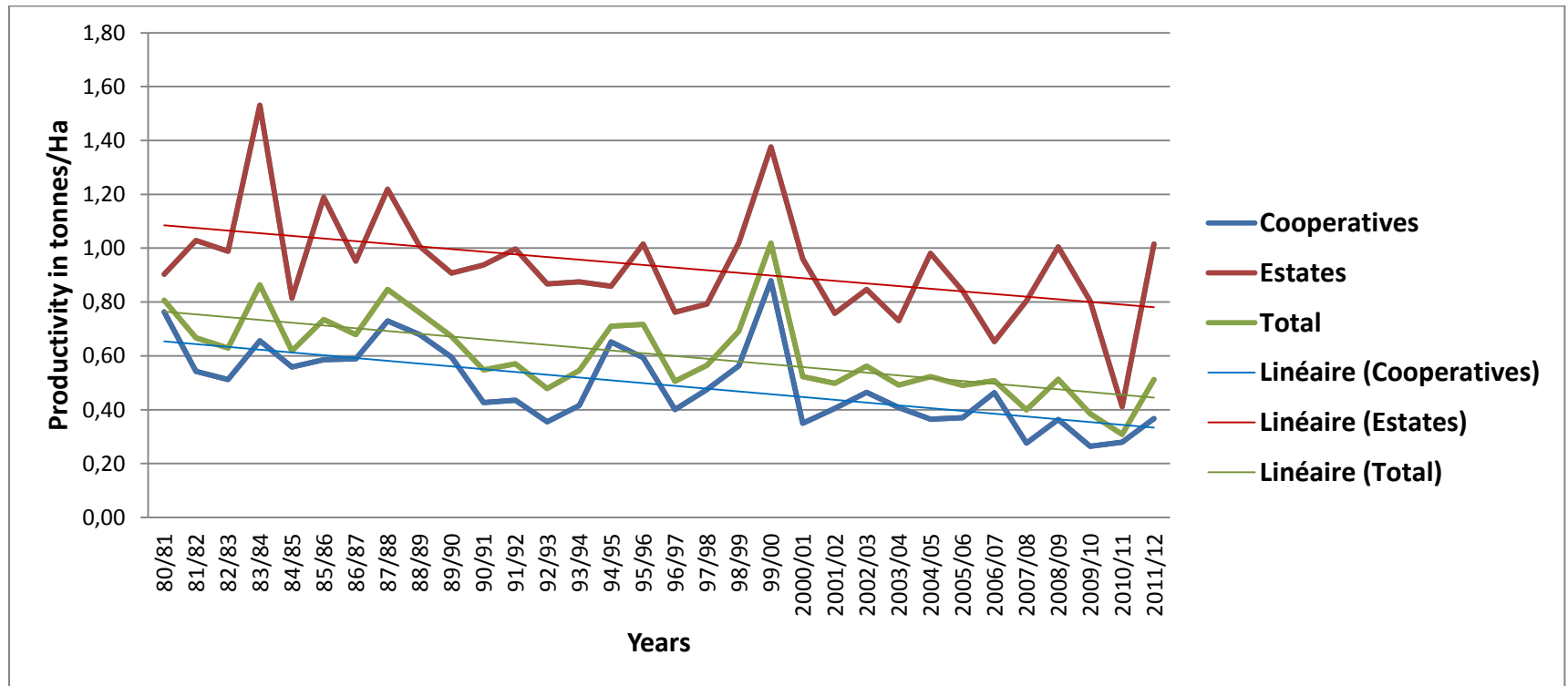
Generally, coffee farmers in Kenya are producing an average of 2kg of berries per coffee tree, a yield that is still perceived to be very low. The coffee productivity trend for the last three decades has declined. As shown in figure 6, average productivity in 1980/81 was 0.81 MTs/Ha compared with 0.51 MTs/Ha in 2011/12. But when productivity levels for small-holder and estates are considered the scenario changes in that estates have been maintaining higher levels of productivity than cooperatives. For example in 1980/81 cooperatives and estates registered 0.76 MTs/Ha and 0.90 MTs/Ha respectively as compared to 2011/12 where they registered 0.37 MTs/Ha and 1.02 MTs/Ha respectively. The difference is explained by the factors mentioned above.

As shown in figure 6, the two graphs for cooperatives and estates have maintained almost equal gaps throughout the three decades and also moves in the same direction at the same time (forward, upwards and downwards). This shows that everything being equal, the gap between the two graphs is largely attributed to input usage (fertilizer, seeds/seedlings, management styles, credit, agrochemicals) while the movement along the graphs is attributed to factors beyond farmer's control (climate change, international coffee prices, input prices, pests and diseases) (Karanja, 1994). To seal the gap therefore, small-holder farmers must increase the level and frequency of input usage to the recommended levels.

Coffee performance also varies depending on the Agro-Ecological Zones (AEZ). Kenyan coffee growing areas are classified into three AEZs namely: Upper Medium 1 (UM1- commonly referred as coffee-tea zone), Upper Medium 2 (UM2) and Upper Medium 3 (UM3) (Nyoro, 1999). The three AEZs are classified based on the soil fertility, temperature and rainfall levels and pattern received by each zone. UM1, UM2 and UM3 produce an average of 357, 690 and

425 Kgs of clean coffee per hectare respectively. Productivity in UM2 is higher than in UM3 and UM1. The reason is that, in UM1 rainfall is high thus discourages flowering pattern and slows the growth and development of berries. Infestation of fungal diseases, pests and weeds is also high thus reducing the yields. In the case of UM3, the rainfall received is less with relatively high temperatures and nutrient deficiencies. Also there is high prevalence of pests and disease at such conditions thus cumulatively affecting the average yields in the zone. UM2 has moderate conditions thus relatively high yields is achieved (Nyoro, 1988).

Figure 6: Kenya Coffee Productivity Trend



Source: Coffee Research Foundation

2.4.5 Challenges Facing Production and Productivity

Production and price risks have been the major challenges affecting coffee farmers. Production risks mainly constitute the effects of climate change, land scarcity and pests and diseases. On the other hand, price risks include high inflation rates and input-output price fluctuation as a consequence of international market forces and changes within the Kenyan economy (Nyoro, 1999). Scale of production also indicates variation in the yields/incomes generated by coffee farms. As compared to large-scale coffee production systems, small-scale systems attain generally low yields because of poor crop husbandry, limited access to credit and inadequate investment in high productivity inputs such as fertilizer and agrochemicals. It is further revealed that the role of cooperative societies in offering credit facilities and input supply has been diminishing (Nyoro, 1999). As an outcome of this, resource constrained farmers are more likely to engage in less resource demanding farm enterprises. For example Nyoro (1999) noted that, resource constrained farmers in coffee-tea zones are likely to engage in tea than coffee because tea does not require much of inputs such as fertilizer and agrochemicals as in coffee production.

Lack or Poor application of Agricultural Practices (GAP) and Good Management Practices (GMP) leads to low productivity and production in coffee (Robert, 2011). Poor crop husbandry practices among small-scale farmers have been largely attributed to lack of adequate education/technical knowledge and working capital to perform the operations as recommended (Lamond, 2007) which has an impact on yields and prices/quality of coffee. Also there is disincentive to perform the recommended practices arising from the low and fluctuating coffee prices.

Population pressure (and also not forgetting poor land policy) brings about land subdivision and fragmentation and poses greater problems in the near future (Bebe, *et al.*, 2003). Currently the small-scale farms range between 1-5 acres and is expected to result further in much smaller farms due to inheritance laws (Kennedy, 2005). This therefore threatens to make coffee farming unsustainable as a livelihood.

To date, pests and diseases are still one of the major barriers in coffee production. Infestation of pests such as leaf miner, leaf skeletonizer, green scales and diseases such as Coffee Berry Disease (CBD) and Leaf rust can substantially lower yields. Pest and disease infestation is currently viewed as one of the major factors constraining production of organic coffee in Kenya (Kennedy, 2005). In terms of coffee varieties, little effort has been put to develop new and productive varieties. It is well known that since 1950s, only two new varieties (Ruiru 11 and Batian) has been developed which was expected to be high yielding and disease resistant relative to traditional varieties (Kennedy, 2005). It is sad that for the last 60 years only two varieties have been produced. Despite Ruiru 11 having many positive expectations, its adoption and performance for the last five years has been poor. It is estimated that 2-3% of the coffee grown in Kenya is Ruiru 11 (Kennedy, 2005). Karanja (1993) disclosed the following constraints in adoption and production of new coffee varieties (particularly Ruiru 11: Lack of technical of information on production of the varieties (20%), lack of establishment capital (20%), lack of land for expansion (41%) and lack of access to seedlings (13%). The high response in land constraint is related to high population in central Kenya.

Prompt payment is also a challenge in coffee industry. It is widely recognized that farmers make production decisions based on prediction and perceived price trend and therefore timely and high farm output prices acts as an incentive to farmers to improve the quantity and quality of their

products (Onchoke and Nyoro, 1991). Unlike in coffee, farmers in tea industry are paid monthly which enables them to meet working capital requirements to finance urgent farm operations (Nyoro, 1999). With respect to Kenyan coffee industry, Kennedy (2005) wrote “Part of the problem is timeliness of payment by the marketing agent to the cooperative. The farmer delivers his cherry to the factory, and months and months can go by before he sees any money”. Lack of prompt payment in Kenyan coffee industry constraints production and productivity given that majority of the farmers are smallholder who frequently lacks working capital. The greater negative effect is also felt on the performance of Kenyan economy since the low production and productivity leads to low exports and thus less foreign exchange earnings.

Away from lack of timeliness in payment is another problem of low prices received by the farmers. It is pointed out that In 2002 coffee prices collapsed to their lowest point in real terms for the first time in a century which affected negatively export earnings for many countries (Kenya inclusive) and farmers incomes (Osorio, 2002;NRI, 2006). In fact it is reported that the price was so low that it could not cover production costs. Other studies realized that, low prices received by Kenyan coffee farmers are not only caused by the low quality of their produce and supply shocks from the international markets but also heavily determined by the rampant corruption and bureaucratic systems within the government and societies where the money is channelled through. That is, the coffee marketing system is made up of many players ranging from ministers of agriculture, cooperative development..... to the Coffee Board of Kenya (CBK), the Kenya Planters Cooperative Union (KPCU), cooperatives, millers and so many other players (Kennedy, 2005). Lamond (2007) also discovered that ‘middle men’ and ‘cartels’ are responsible for low prices received by the farmers. Many players create long and bureaucratic chain that brings about what is known as “money flow through problem”. When money passes through

long chains or rather many hands, it is susceptible to corruption, wastes time and unnecessary costs are incurred before reaching the receiving end. Assuming everything being equal, the impact of prolonged price depression is the current abandonment of coffee production.

2.4.6 New emerging challenges

Challenges facing coffee production industry are dynamic. Challenges come and go, persist and new others arising. Apart from the conventionally known challenges (pests and diseases, lack of good GAP and GMP and price fluctuations), there is new set of challenges emergence which were previously either insignificant or nonexistent. These include increasing urbanisation and industrialisation as a result of population pressure. In the peri-urban areas, real estate businesses have become an attractive alternative. Several large coffee farms around Nairobi, Kiambu, Thika and Nyeri are under real estate development. These include among others Runda, Tatu, Migaa, Tassia, Jumapili, Ngoingwa, Murera and Kandara investments. The effect has seen coffee production shifting from East of Rift to West of Rift. Climate and weather change is also another new threat. Climate change brings about wide variation in temperatures and irregular rainfall amounts and pattern. Robert (2007) reports that frost; hailstorms, strong winds and drought are the current problems faced by Ugandan coffee farmers as a result of change in climate since it had not been experienced before. All these have a large negative impact on coffee production and productivity levels. Furthermore, the impact is beginning to render some of the current coffee producing zones irrelevant especially UM3 zones in Kenya.

Cost and shortage of labour is also a new threat in coffee industry which is brought about by formal education and urban migration factors. As people access formal education, they tend to demand more wages and also run away from farming (commonly referred as “dirty job”) to white collar jobs thus creating labour shortage on the ground. Consequently, the lack of labour is

compounded by low levels of mechanization due to smallholder farmers (Robert, 2011). Diversification in farming has a direct negative impact on coffee production due to the scarcity of land and labour. It is reported that Land, labour and finances have been lost coffee in coffee production as farmers switch to other enterprise on the promise of quicker and better returns. However, incorrect market information can influence farmers to migrate to alternative crops that will not benefit them (Robert, 2011). Generally the shift will negatively affect economic, social and environmental benefits. Youth in coffee producing countries have shunned coffee production. Some engage in petty trade like motorcycle taxi [*boda boda*] and hair salons while others are just idle and disorderly. In Uganda, only 6% of the coffee farmers are youth of 30 years and less and about 56% age between 31-70 years (Robert, 2011). Such scenario is present and growing in Kenya.

Gender disparity in coffee production is a common factor in agricultural sectors for developing nations. In Africa, men are assumed to be the owners of cash crops while women take over food crops like vegetables. Very few women are involved in decision making process and furthermore, men are owners and controllers of cash generated in a household irrespective of whether he is wise spender or not. There is weakening political support and too much politicking. Oil exploration, exports such as cut flowers, horticulture and others have outcompeted coffee on the Kenya's political agenda. According to Robert (2011) Glamorous" exports such as oil cut flowers, tea and tobacco in Uganda have overshadowed coffee on the political agenda. The lack of support especially in production has derailed the consolidation and scaling up of the coffee production campaign in the country. Government allocates insufficient funds to cater for research work and extension services in coffee production industry.

2.5 Efforts to Overcome Coffee Production Challenges

To move against the challenges, farmers are getting adapted in many ways. Enterprise diversification is one of the major strategies where farmers in Kenya engage in different on-farm and off-farm activities to stabilize their incomes (Kibet *et. al*, 2010a). In coffee industry Nyoro (1999) established that coffee farmers particularly estates have ventured into floriculture (e.g. roses and carnations) and horticulture production to supplement and stabilize their incomes. To curb the effects of land scarcity, input-output price and income fluctuations and food insecurity, small-scale interplant coffee with maize and beans, English potatoes or coffee and tea (Nyoro, 1991). To mitigate the effects of climate change, farmers have adopted agro-forestry on their coffee farms. According to Kennedy (2005), shade trees helps to modify the microclimate (by reducing temperature during periods of long dry spell), provides nutrients to the soil and to provide mulching material.

Diversification in credit sources by farmers have enabled them access relevant inputs in terms of adequacy and timelines which are key issues to improving productivity and production of coffee. Credit sources range from cooperative societies, informal lending groups, unions to formal commercial banks (CRF Crop Assessment Report, 2011). To eliminate gender inequality in agricultural sector (coffee sub-sector inclusive), several gender-mainstreaming commitments and efforts have been done by the Kenyan government (MoA, 2010) and include:

- i. Signing the Beijing Platform for Action, the Convention on the Elimination of all forms of Discrimination against Women (CEDAW), the Millennium Declaration and Millennium Development Goals to eliminate all forms of discrimination against women.

- ii. Development of National Gender Policy for Development and Equality in the year 2000 to provide a coherent and comprehensive overall framework for guiding sectors and agencies involved in gender work.
- iii. Development of a National Commission on Gender & Development Act created in the year 2003 and establishment of National Commission on Gender and Development in 2004 to appraise the performance of the government institutions on matters of mainstreaming gender concerns.
- iv. Establishment of Ministry of Gender, Children and Social Development in 2005 to ensure women empowerment through mainstreaming the needs of women and men boys and girls in all sectors of development in order to participate and benefit them.
- v. Creation of a framework for implementing Gender Policy in 2006 through the Sessional Paper No. 2 of 2006 on Gender Equality and Development because development initiatives impact differently on men and women.
- vi. Presidential Directive issued in 2008 requiring a minimum of 30% threshold for women representation in senior positions in the Public Service.
- vii. Gender incorporation into Kenya's Public Sector Performance Contract guidelines in 2009. That is State Corporations, Local Authorities, Public Universities and Tertiary Institutions are required to submit quarterly reports on gender mainstreaming efforts to the Ministry of Gender, Children and Social Development.
- viii. Vision 2030 is explicit on gender mainstreaming under social pillar. The expected actions include: development of a framework to guide mainstreaming activities,

identification of gender concerns, needs and priorities and means to address, compliance with 30% women representation in policy (recruitment, promotion and appointments at all levels) and collection of sex disaggregated data to guide programmes (Vision, 2030).

- ix. The introduction of Strategy for Revitalization of Agriculture (SRA) in 2004 to recognize the important role played by women in agricultural sector and furthermore the high prevalence of poverty among women.
- x. The introduction of Agricultural Sector Development Strategy (ASDS) which recognizes that women contribute over 70% of labour in households. The new constitution which provides for equal rights and privileges for both men and women. If constitution is properly implemented, it will ensure gender equity in terms of access and control of production resources.

2.6 KIAMBU COUNTY DEMOGRAPHICS

According to Kenya Bureau of Statistics;

Rural is a large and isolated area of an open country (in reference to open fields and not forests) often with low population density (Kenya National Bureau of Statistics, 2009).

Urban is an area with an increased density of human created structures in comparison to the areas surrounding it and has a population of 2000 and above. In this definition urban areas include the following; Cities, Municipalities, Town councils and Urban councils (Kenya National Bureau of Statistics, 2009).

MAP OF KIAMBU COUNTY

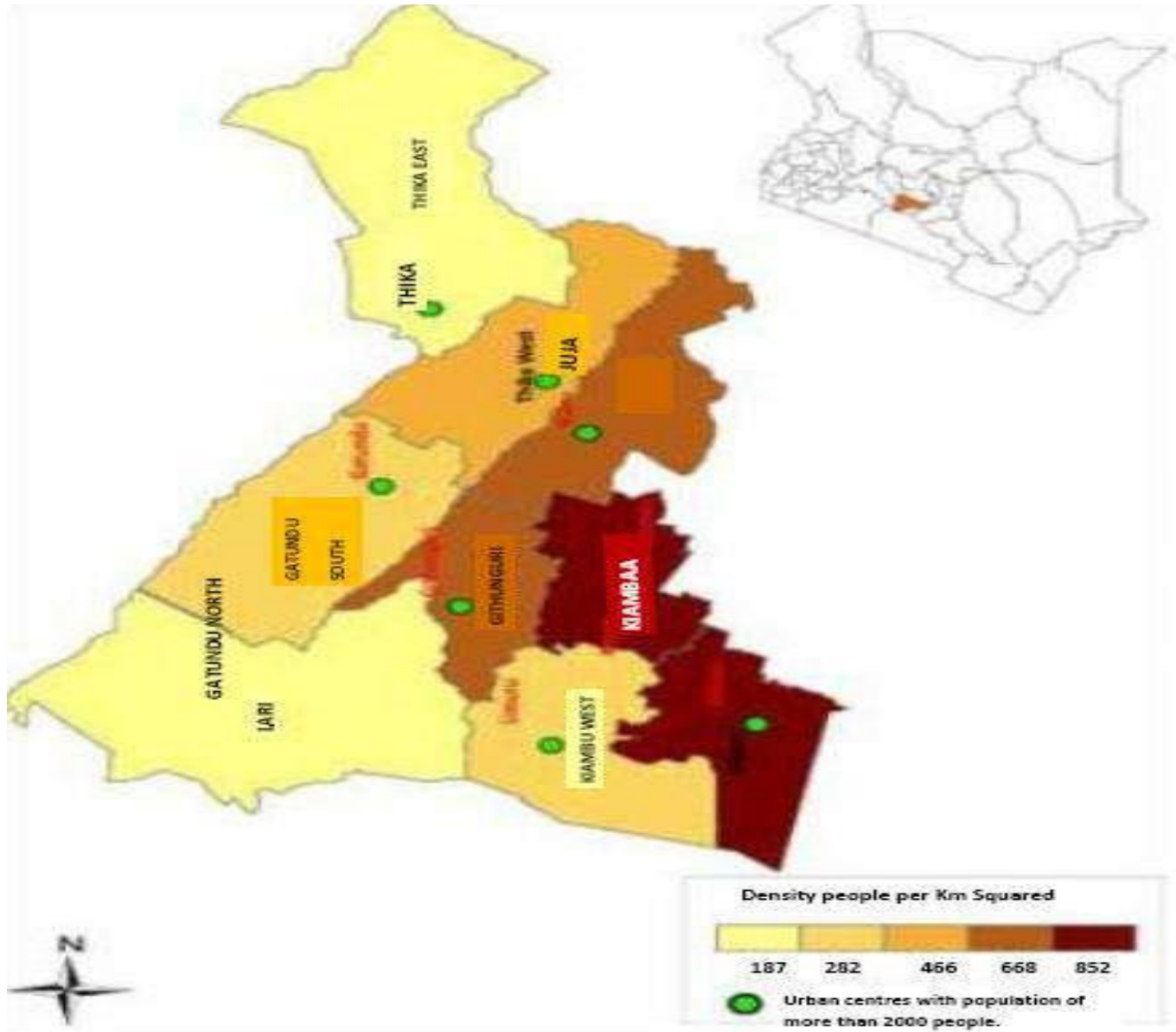


Table 1: Kiambu County rural population distribution by sex and number of house hold (2009 census)

Area	Male	Female	Household
Kiambu East (Kiambaa)	125,796	127,955	75,342
Kikuyu	130,370	135,459	77,045
Kiambu west	65,193	65,939	36,542
Lari	60,632	63,263	30,779
Githunguri	72,845	74,918	39,350
Thika East	38,778	38,295	20,441
Thika west	109,914	108,630	72,051
Ruiru	120,550	120,457	75,184
Total	724,078	734,916	426,734

Table 2: the areas in square kilometers and Density

Area	Area in square kilometers	Density
Kiambu east	189.1	1,342
Kikuyu	236.1	1,126
Kiambu west	281.7	466
Lari	439.2	282
Githunguri	173.5	852
Thika East	413.0	187
Thika west	327.1	668
Ruiru	292.0	825

Total	2351.7	5748
-------	--------	------

Table 3: Kiambu County urban population distribution

According to previous census population in Kiambu has been increasing both due to increase in new births and in-migration of people from other areas since Kiambu County hosts or houses many people who work in Nairobi which is the Capital City and also because there are many industries and large farms where people come to work.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter documents the methodology that was used in gathering data. It covers research design, target population, sample design, research tools and data analysis. The study sought to investigate the spatio-temporal dynamics of coffee estates farming system and livelihood conditions of the workers.

3.2 Study Location

Kiambu County is within Central Kenya it constitutes twelve constituencies; Gatundu South, Gatundu North, Juja, Thika Town, Ruiru, Githunguri, Kiambu, Kiambaa, Kabete, Kikuyu, Limuru and Lari. It is a high potential agricultural area with good soils and favorable rainfall. The population tally in the county according to the Kenya National Bureau of Statistics report of 2009 is 1,623,282. The county has one of the wealthiest people, who primarily work in the civil service, carry out business, are farmers or in informal employment. Most people living here are predominantly farmers growing tea and coffee as cash crops alongside food crops such as maize, beans, assorted vegetables and sweet potatoes and keeping of dairy cows, which is a very lucrative business in the County.

3.3 Research Design

The study utilized a descriptive research design and quantitative methods. This design enables a comparison of opinions of respondents regarding the spatio-temporal dynamics of coffee estates

farming system and livelihood conditions of the workers based on the respondents' characteristics.

3.4 Target Population

The study targeted all coffee estate managers and coffee workers in Kiambu County.

3.5 Sampling Technique

The study used purposive sampling in order to achieve a high degree of representation from estates with different management.

3.6 Data Collection Tools

The following data collection tools were used:

- i. An interview guide was used. The instrument provides the researcher with an easy accumulation of data. The interview guide consisted open ended questions.
- ii. Interviews were used for both the estate managers and estate workers.

3.7 Ethical Considerations

The participants were informed of the purpose of the study before information was sought from them through an introductory letter from Coffee Research Foundation, thus conforming to the principle of voluntary and informed consent. Honesty, integrity and confidentiality were highly maintained throughout the study.

3.8 Data Processing and Analysis

The collected data was processed and analyzed using excel. The data was summarized by percentages, graphs and pie charts which are explained thereafter.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

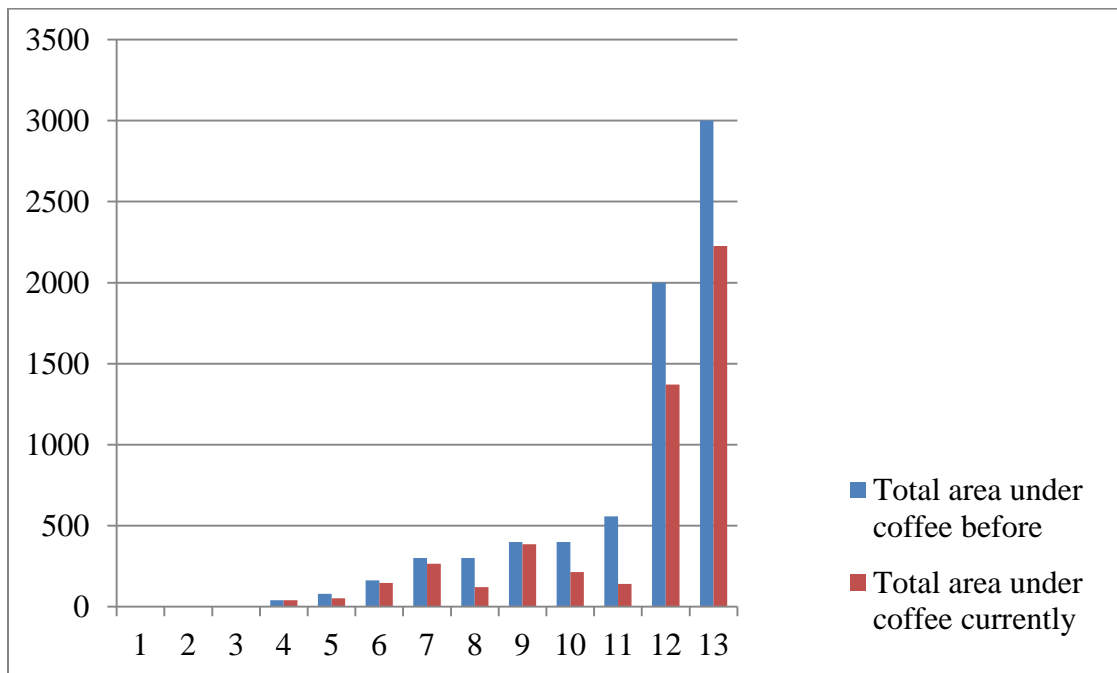
4.1 Introduction

This chapter presents the findings from a field survey conducted between August-December 2013 in Kiambu County. The chapter starts with Coffee estate information with regards to evolution of land use, area of estate under coffee before and after, evolution of coffee agroforestry system, while the rest of the section contains information about coffee workers characteristics.

4.2 RESULTS OF DYNAMICS OF CHANGE IN TERMS OF LAND USE IN KIAMBU COFFEE ESTATES

4.2.1 EVOLUTION OF LAND USE

Figure 7: Area Under Coffee in the 90s and Currently in the Sampled Estates

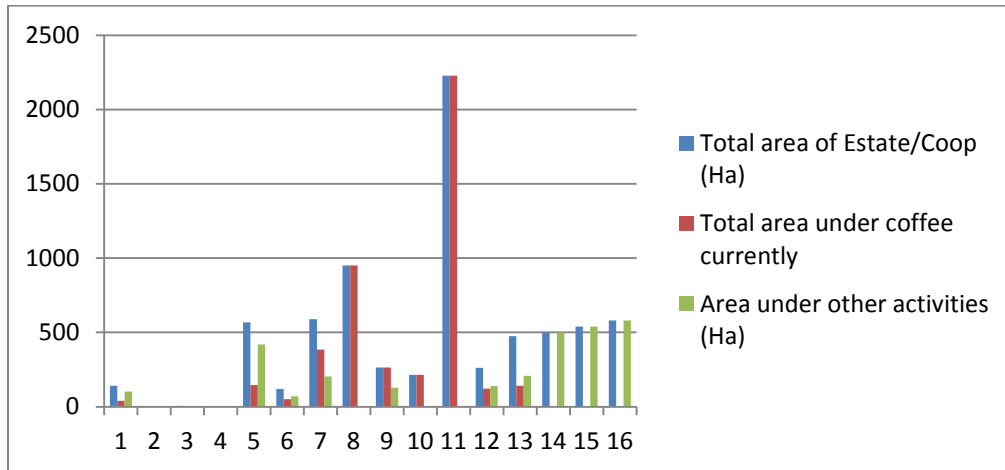


The hectares of land under coffee in the sampled coffee estates have been decreasing over the years as evident in the graph with the average coffee area loss being 31%. This has been due to the unpredictable nature of coffee prices and others. Karanja and Nyoro (2002) explain that these decreases could be attributed to neglect of farms and uprooting mainly as a result of the slump in coffee prices, competition from other farm enterprises and the need to create room for human settlement. This is especially the case in the traditional coffee zones of Central, Eastern and Western Kenya, which have high population densities.

The prospects for coffee expansion are therefore quite limited in these traditional areas as land unit per household continues to decrease as a result of population growth and sub-division. Nevertheless, limited coffee expansion has occurred in the recent past in some non-traditional coffee zones mainly in Rift Valley Province such as Uasin Gishu and Trans Nzoia districts. This expansion has been driven by the desire of farmers in these areas to diversify from maize and dairy production. In the graph above Estate number 14-16 were coffee estates in Mangu area that have recently been converted to real estate. At the time of the interview, a quarter acre piece of land was being sold at between 1.5 million to 2.5 million depending on the location; that is those near the road (Thika super highway) tend to be more expensive.

4.2.2 Area of Estate under Other Activities

Figure 8: Area of the Estates under Other Activities



Most estates have large parcels of land and they do not farm coffee only. This is because of the seasonality of coffee and fluctuation of coffee prices, making them venture into other enterprises. Most coffee estates in Githunguri area have ventured into dairy farming which is a lucrative business in the area since it has one of the largest milk processing companies in Kenya, that is, Githunguri dairy; So in this area 98% of the estates and cooperatives have zero grazing units, for dairy cows. These estates also plant Napier grass which is used to feed the cows.

In other areas such as Mangu area coffee estates have quarries, where they do stone mining. Mangu area is one of the major stone mining areas in Kenya since it supplies stones to Nairobi and its environs. Stone mining is a lucrative business, one block of stone ranges from 12 shillings to 30 shillings depending on quality. According to one manager whose estate has a stone mine, earn half a million shillings and above every day, due to the influx of real estates and other housing projects in Nairobi and Kiambu area. Estates in Mangu have also ventured into horticulture that is, flower farming and farming of other horticultural crops such as spices, herbs

and French beans. Which they say fetches a lot of money for the estate than coffee does; this is also evident in Kenyan statistics that rate horticultural exports higher than coffee export earnings. According to FAO (2013); In recent years in Kenya, coffee accounted for only about 6% of agricultural exports, while horticulture and tea exports have increased substantially, accounting for 34% and 32% percent of agricultural exports, respectively.

Most coffee estates in Kiambu that is in Githunguri, Ndederu, Migaa, Kirigiti, Ruiru, Ruera and Mangu, have ventured into real estate business. A coffee estate that was sampled in the survey that is Ruera, recently, that is, beginning of November got approval to change land use and they have already disclosed that they are building a ultra modern estate. According to a survey carried out by Dirkson property Limited, Kenya real estate sub-sector and infrastructure development continues to experience robust growth accelerated by high demand for housing. This coupled with the increased investor confidence in the Kenya real estate sector. Real estate property market is booming especially because of the growth in the mortgage financing and infrastructure in the country.

The construction of the Thika super highway has also led to coming up of big real estate's as it has improved accessibility to Nairobi Central Business District (CBD) and at the same time the estates are set up in serene and quiet environment. Examples of major estates in Kiambu County are Tatu city, five star meadows, Jacaranda estate, Kirigiti Estate, Migaa estate and Buffalo Hills. The worrying fact is that this real estate's were once coffee farms. While the older generation in Kenya may want to hold on to the farms for sentimental value, income generation or as family heritage, the younger generation seems to prefer to trade their inherited coffee farms for real Estate and capitalize on upcoming expanding cities. Private companies that own some of the expansive coffee plantations within Kiambu area choose to sell of their land to capitalize on the

increased value of land. Depending on location, a farmer can sell an acre of land in Kiambu for approximately Ksh 30 million.

4.2.3 Growth of Real Estate

As documented in the Standard newspaper on June 27th 2013 by Eric Wainaina, Kiambu lands office is in a dilemma over what to do with the rising number of individuals and organizations seeking to change the use of large chunks of land in their ownership from agricultural to commercial use. A large number of tea, coffee and milk producers want to be allowed to put up real estate developments on such land. Lands officials, sometimes, find it difficult to control the mad-rush to change use because of inadequate laws.

John Kamau, the Kiambu District Lands Administration Officer, says they receive at least five applications per week from people wishing to change land use from agricultural to commercial. Most applicants, he said, are people with small parcels of lands. He, however, says even those with huge chunks have been applying for change of user, although some have been turned down. Last year, he says, a large-scale tea, coffee and milk producer applied seeking to change a coffee farm in Kiambu into commercial use, but they denied approval. Many people have applied for change of land use and we approve them because we do not have a policy to regulate this process,” says Kamau.

Policy vacuum According to Kamau, a policy to regulate change of use that would have controlled the situation is in the process of formulation but has not been finalised. “There is nothing we can do because any time we decline to assent to applications for change of use, the applicants demand we quote the law in question. Note that farmers no longer have to seek permission from the Government to uproot coffee after the industry was liberalised some years

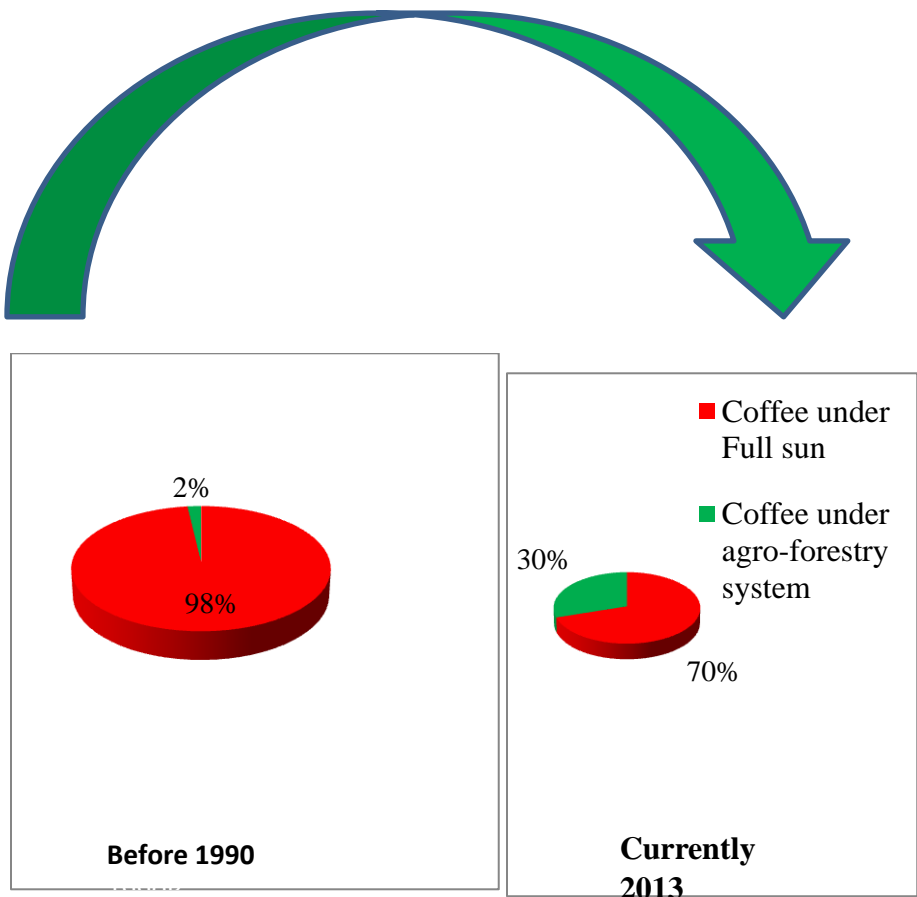
back,” Kiambu, previously an agricultural zone, has become the destination of choice for real estate investors seeking to cash in on the high-end housing demand in Nairobi and its environs; As a result, tea, coffee and milk farming, which were the main source of income in this area, are being abandoned in their place have come up expensive lifestyle apartments and modern mansions. Farmers have been uprooting coffee, once the biggest economic crop, to set up rental flats, which they say fetch huge returns. They include Tatu City in Ruiru, Migaa and Edenville on the outskirts of Kiambu town. Acres of coffee bushes were uprooted to pave way for these projects. People with small parcels of land are either changing use to allow them construct rental flats, or are taking advantage of the increased land prices to sell them to people who want to put up palatial homes.

The areas mostly affected are Kiambu, Thika, Kikuyu, Ruiru, Juja and parts of Githunguri districts where construction activities have been taking place each day. Landowners in these areas have been thronging to the area lands offices seeking to change use. Kiambu Road, starting from Runda to Kiambu town, previously a stretch of coffee plantation, is now dominated by palatial homes and estates., for instance, EdenVille, a premier gated community on the outskirts of Kiambu town, sits on 149.5 acres, which were previously a coffee and maize plantation. Others include Tatu City and Migaa which were previously coffee estates. Silvester Ngamau, a property agent, says the collapse of the coffee sector in the yesteryears frustrated most farmers who have now decided to go into the high paying housing sector. “Someone with half-an-acre piece of land would rather have a block of flats on it. A coffee farm gets return once a year, but with a rental flat, he is sure of getting good money at the end of every month,” says Ngamau. Ngamau, the director of Zoom Real, a property agent with interests in Kiambu County, adds that

many people in those areas have sub-divided their farms into small plots that are not feasible for farming.

4.2.4 Evolution of the Coffee Agroforestry System

Figure 9: Evolution of Coffee Agroforestry



The area of land under agro forestry has been increased in all the estates sampled. The reasons for this was explained by the managers to be; Certification since for an estate to be certified then it needs to practice agro forestry and also due to soil conservation. In addition to these estates both small and big are devoting more land to trees. This is because of the high demand for timber in the country, due to the booming construction industry. One tree goes for SH8000 to 18000 depending on the tree size. This investment is only done by farms that have money and land

since for one to get profit then they have to plant a lot of trees hence making it an investment for the rich. The poor are not able to do this since they have small tracts of land that they use for subsistent farming and also they do not have alternative sources of income that can sustain them for years till the trees are mature enough for sale.

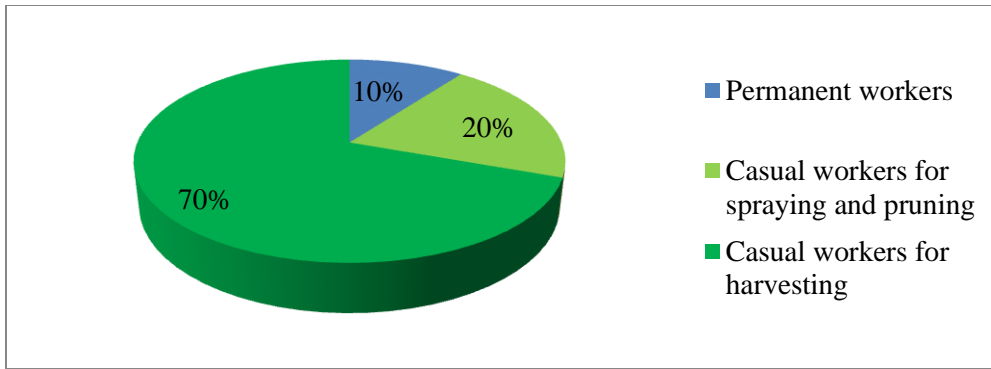
4.3 RESULTS OF WORKERS CHARACTERISTICS AND MANAGEMENT

4.3.1 Workers Characteristics

Figure 10: Percentage of Permanent and Casual Workers

ESTATE	ACREAGE (Ha)	NUMBER OF PERMANENT WORKERS	NUMBER OF CASUAL	
			PEAK PEAK	OFF
1	141.7	40	300	20
2	4.04	1	15	3
3	6.07	7	15	2
4	Not given	4	20	4
5	567	12	500	100
6	121	26	150	45
7	589	80	800	200
8	951.4	49	Not given	Not give n
9	265.3	100	350	80
10	215	35	70	0
11	2227	0	0	0
12	262	64	700	140
13	476	62	400	260
14	500	N/A	N/A	N/A
15	540	N/A	N/A	N/A
16	580	N/A	N/A	N/A

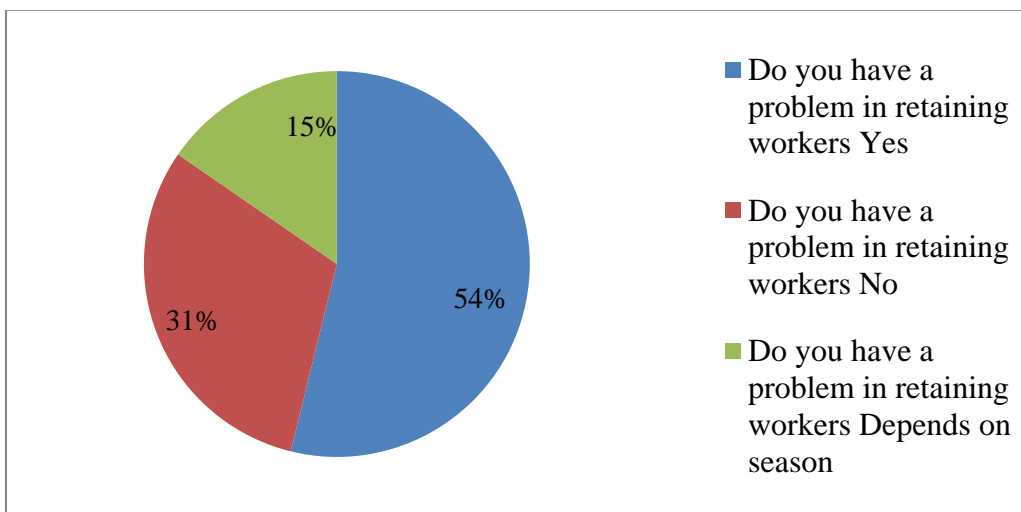
Figure 11 : Percentage of permanent and casual workers (based on their number/year)



Estates do not employ many permanent workers since its costly, this is because for permanent workers the employer has to provide pension, insurance, monthly salary and allowances and other benefits, hence making it impossible for estates to employ many permanent workers, since their main business is making profit. Coffee farming is seasonal that is it has peak season which is the harvesting season and the off peak season. During the peak season casual workers are sourced in large quantities, sometimes even transported from far off villages, at times as far as 100 kilometers away as the case of one farm in Ruiru that fetches for workers in Kangundo and Tala area due to competition for workers during the peak season.

4.3.2 Retention of Workers

Figure 12: Problems of Retention of Workers



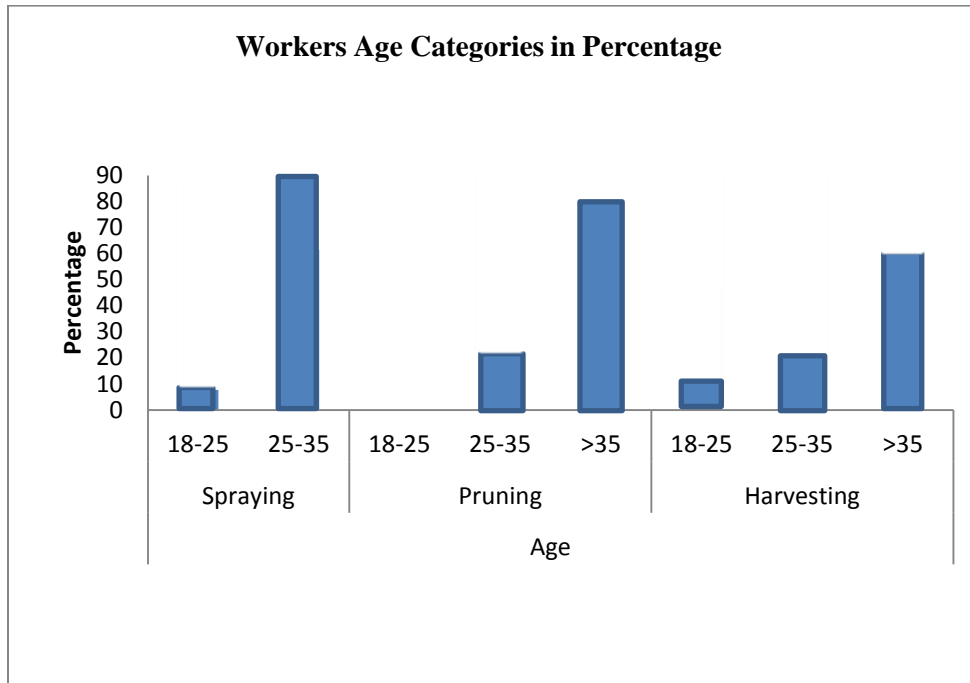
54% of the estates sampled had a problem with getting and retaining workers due competition from other sectors in the economy that are perceived to be better than agriculture or those that pay more than agricultural work. Some of these sectors are the transport sector, manufacturing and service sector. The young people who work in the agricultural workers do it temporary to enable them save to start their own business. One of the major businesses that they venture in is the '*bodaboda*' business that is using motorbikes as taxis. In Kenya the minimum amount of money that a *bodaboda* business gets in a day is 500 shillings which is higher than the 220 shillings paid in the coffee farms. For estates in Githunguri area, retention of workers is low because of the competition for workers with the dairy sector which is vibrant in the area, in this area casual workers are paid 300 shillings and above which is more than what estates pay.

Other factors such as road or infrastructure development also affects the retention of wokers, for example in 2009-2012 Estates in Thika and Mangu area had a problem retaining workers and this was because of the construction of the Thika Super Highway, where workers would be paid 500 shillings and above depending on their skills.

Estates have tried to resolve this problem by giving incentives such as offering transport for workers, paying more than other estates, offering affordable housing, paying on time and giving pasture and firewood to the workers. 30% of the estate sampled provide transport as an incentive, 20% offer housing, 20% pay on time, 20% pay more money and 30% give pasture and firewood to the workers.

4.3.3 Workers Age

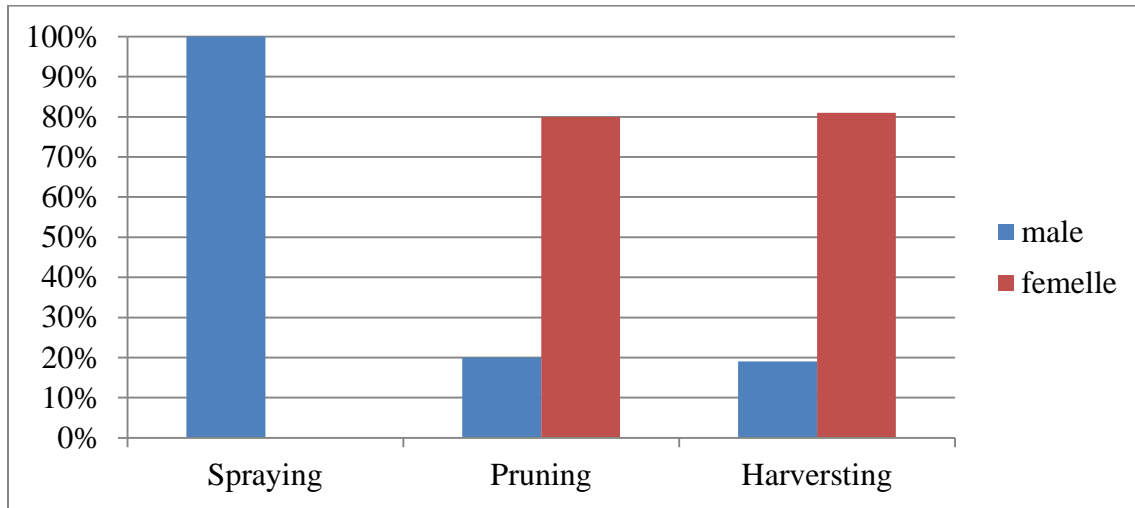
Figure 13: Workers age categories



As shown in the graph above most sprayers are young men, no sprayers that are above 35 years of age and this is because the work needs people who are strong due to carrying of the pumps and nozzles and also people whose respiratory system is functioning properly due to the chemicals that one might inhale during spraying. In pruning the majorities are 35 year olds and above as shown in the graph, standing at 80% and this is because pruning is an art that is perfected over time and estates prefer experienced pruners since pruning contributed or determines the production of the crop. For harvesting it's a mix of all age groups although 35 year olds and above are more and the reason is because most young people or youths do not like doing farm work they prefer moving to town to work in industries or start their own business. Estates do not employ people who are below 18 years of age since they are considered minors according to the laws of Kenya and it is illegal to employ them, as it is deemed as child labour.

4.3.4 Percentage Gender Involvement

Figure 14: Percentage Gender Involvement in Pruning, Spraying and Harvesting



Sprayers are generally young males between the age of 20-35 due to the nature of their job that is, carrying of pumps for long distances, and carrying heavy nozzles in the case of mechanized spraying. Most pruners and harvesters are women with 80% of the in pruning and 81% in harvesting and this is because most men in Kiambu area work in the manufacturing or industry sector in town, operate *bodabodas*, keep dairy cows or are employed in road construction.

4.3.5 Workers Pay and Poverty Level

Casual workers in estates earn 220 shillings a day which is pay that is determined by the Collective Bargaining Agreement (CBA) that is revised every two years. The next review will be in 2014. At this rate then workers earn Ksh 1,320 per week (they work six days a week) and Ksh 5,280 per month making it Ksh 63,300 per year. In Kenya the minimum wage that is set by government is Ksh 300 per day which is 12,000 per month and Ksh108,000 per year. So by this standard then the coffee workers earn Ksh 44,700 less than is required making it less desirable

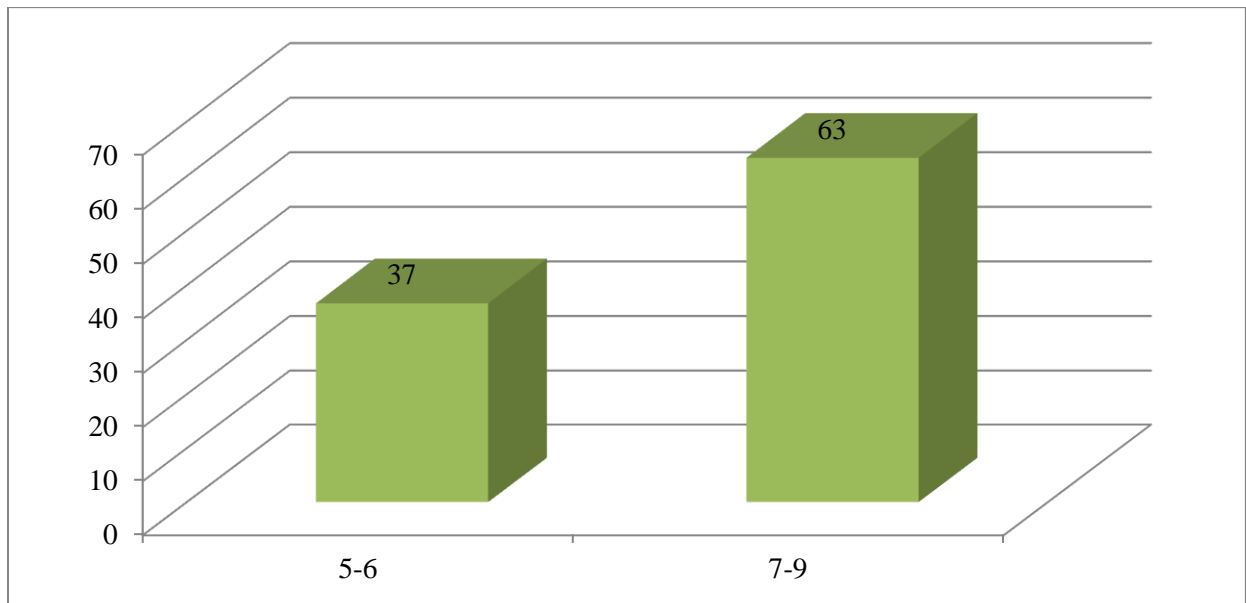
for one to work in this sector. In sectors like manufacturing, service sector and industry they are required to pay as per the government rates for casuals or low skilled individuals..

The poverty line set by the World Bank for developing countries is usually living below 2 dollar a day which is approximately 61000 per year. Based on this rate coffee workers earnings are just above the poverty line, but based on the national poverty indicator of earning less than Ksh 300 per day, the coffee workers are considered to be below the poverty line.

4.4 WORKERS CONDITIONS AND LIVELIHOODS STRATEGIES

The table below shows the hours coffee workers work in a day

Figure 15: Hours worked per day



Workers in the estates have different working hours a day, depending on their job specification. Permanent workers work from eight o'clock in the morning to five in the evening which is in accordance with the Kenyan Employment act section 27 that states that normal working hours usually consist of 45 hours of work per week. This translates to 8 hours of work a day since

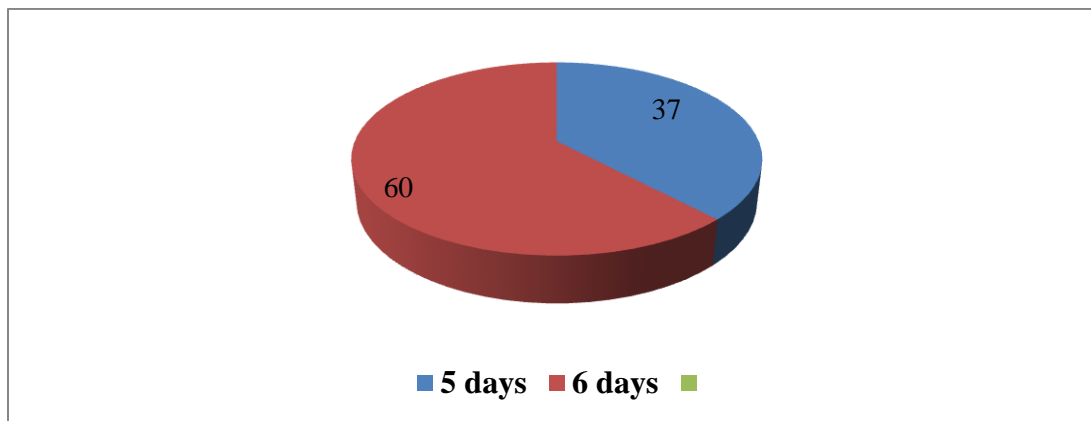
1:00pm-2:00pm is usually free time that is meant for lunch. This makes most permanent workers not to be able to do other businesses to supplement income hence most of them depend on their monthly salary. This is also true among the thirty workers interviewed.

63% of the interviewed workers work for 7-9 hours and most of this are workers on permanent or contractual basis while 37% of the workers who were mostly casual workers work for 5-6 hours a day. Most farm work is done from morning at around 8:00am to around 1:00 and in some cases 2:00pm especially during the off-peak season. But during the peak season which is harvesting season they start as early as 7:00am in most estates and finish in the evening at around 4:30 to 5:00.

4.4.1 Days worked per week

The table below shows how many days coffee workers work in a week

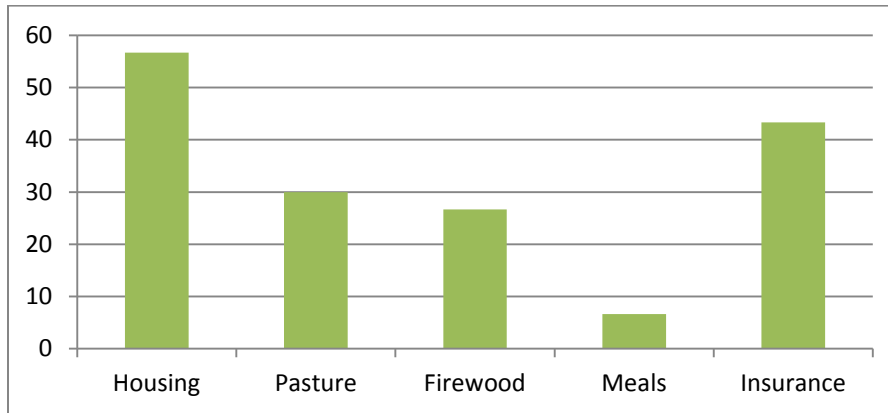
Figure 16: Days worked in a week



Most of the workers (60%) work for six days a week, this applied to casual workers where as 37% work for five days a week and the majority of them being permanent and contractual workers.

4.4.2 None Monetary Benefits

Figure 17: Non Monetary Benefits by Employers



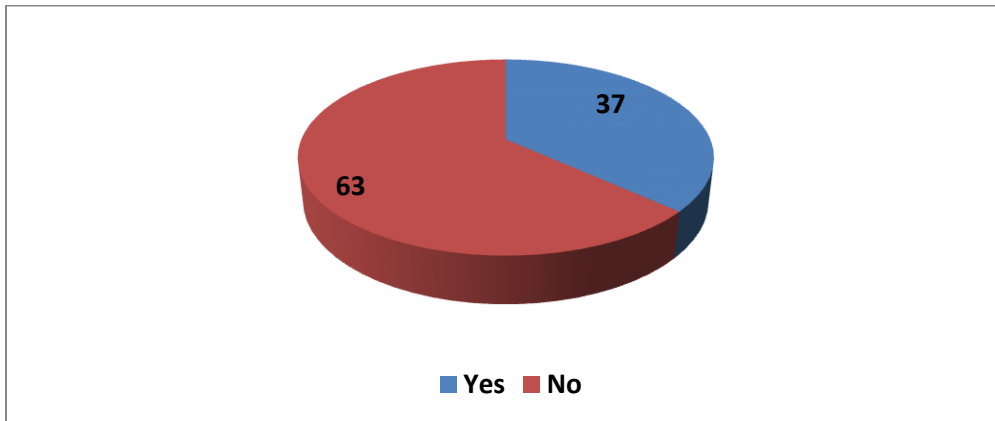
The workers receive benefits from their employers in form of housing, pasture, firewood, meals and insurance. Most permanent and contractual workers receive insurance which is a necessity according to the Kenyan government labour laws. Less than 10% of the same workers also get free lunch that is provided by the employer, this is only done in one of the estates sampled, the rest of the estates do not provide any food to their employees, apart from milk that is given to sprayers as is the requirement by government, due to the harmful chemicals they inhale.

Workers both casual and permanent are given pasture or grass for their animals and allowed to collect firewood from the farm; this is a practice that is replicated in almost all estates. This acts as an incentive, especially for the casual workers to ensure the estate retains them.

4.4.3 Food Insecurity

The table below shows the percentage of workers with food insecurity problem

Figure 18: Food Problems

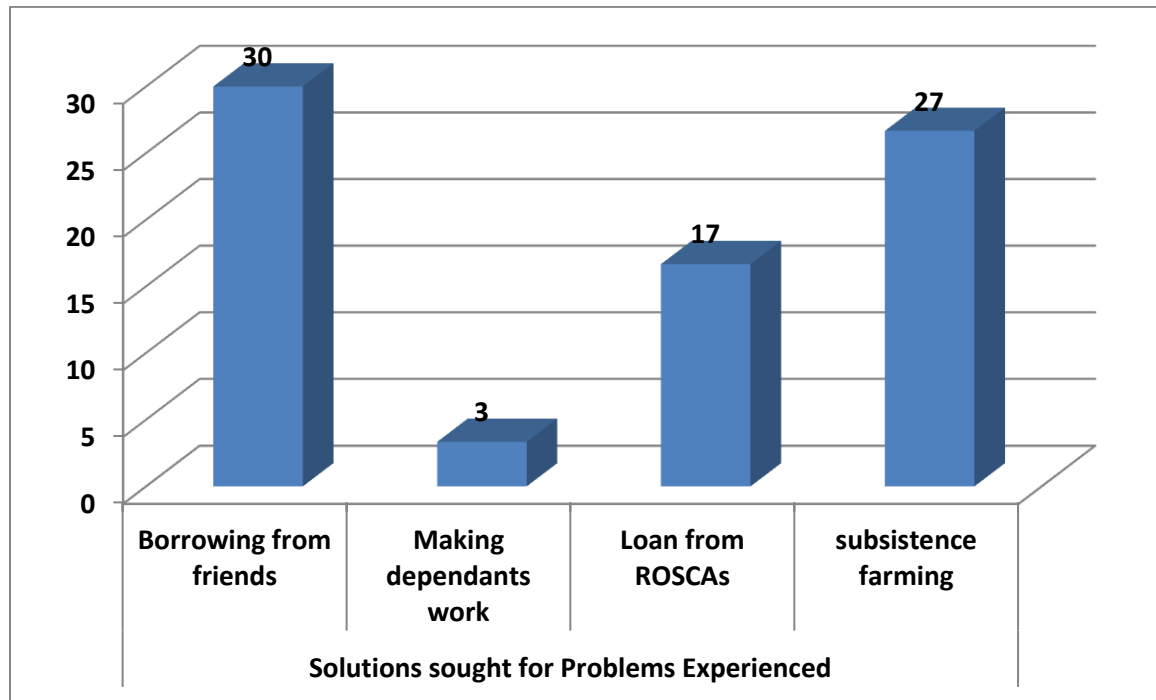


63% of the interviewed workers admitted to having a food insecurity problem. Most of the people with food insecurity problem were casual workers this is because their income is not regular, they lack money to lease land where they can farm, some do not own land that is near where they stay and those who own land and cultivate it its usually a small piece of land that is not able to sustain their consumption needs. The remaining 37% did not have a food problem and most of these were permanent workers and this is because they earn a monthly salary hence they are able to borrow money from SACCOs and buy land which they use to produce food for consumption with others even producing more for sale in the market. In addition most of them are provided with housing by the estate, which have big compounds that they farm vegetables, maize and beans and some fruits mostly bananas which do well in Kiambu County.

4.4.4 Solutions for Food Insecurity

The graph below shows the strategies or solutions sought by the workers in regard to their food insecurity.

Figure 19: Solutions Sought for Food Insecurity



None of the respondents had one solution for the food insecurity problem; they all had various ways of coping with the problem. According to Ludi and Bird (2007), Poor people's strategies in dealing with risks depend on the assets they have at their disposal (including natural, physical, financial, human, social and political assets and on the nature of risks to which they are exposed. The poorer a household, the fewer assets are available for them to rely on in case a shock occurs. Therefore, social protection and risk management strategies (e.g. informal and formal insurance systems, public works, safety nets, cash transfers) need to be devised aiming at providing instruments that allow poor people to minimize impacts of exposure to risks and support them in building up their asset base.

The management strategies by the workers interviewed were borrowing from friends which was highest, that is 30%. This is because they are not ashamed to tell their friends about what they are going through and the other reason stated was that the friends help out since they know that there will come a time when they will also need help.

“...When am not able to get casual labor for a day or two and am unable to feed my children, then my neighbor and friend feeds us if she was lucky to get a job that day, and when I get a job and she does not then I feed them, this is how we survive here...” this was said by one casual worker during the interview.

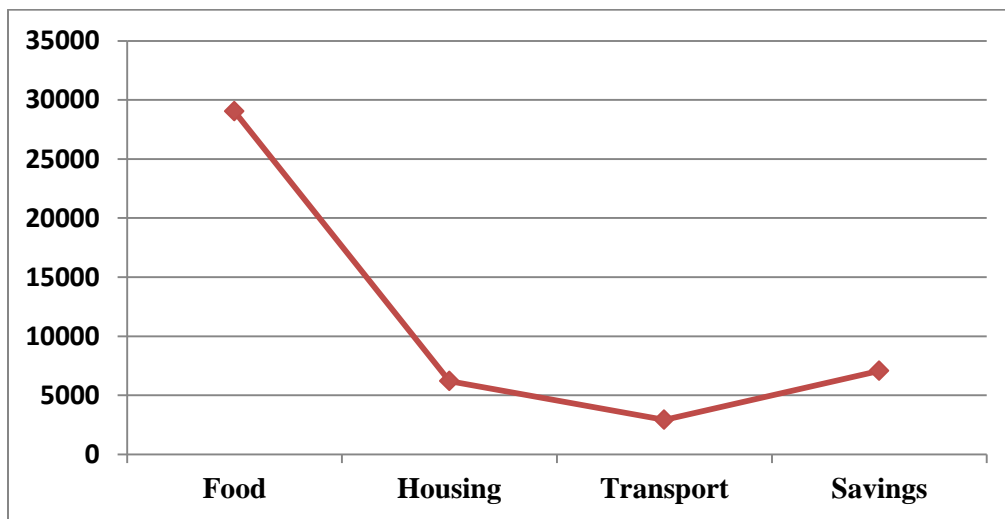
Subsistence farming was the next most used strategy, having 27%, this is because most of the estates are located in rural or peri-urban area, hence people have small pieces of land that they can farm, the problem is that the food harvested is not enough to last until the next season but at least it helps them feed their dependants for some months, most of the workers grow maize and beans in these farms. Maize and beans are used to make a staple food that is ‘*githeri*’ and ‘*ugali*’, and this is why most of the interviewed grow them. 17% of the respondents solve their food problem through rotating savings and credit associations (ROSCAs) which are called ‘merry-go-rounds’ in Kenya. These are informal groups which are mainly women groups that come together and contribute an agreed amount of money weekly, after a fortnight or monthly, then the money is given to one member and the cycle continues till each member has received the whole sum once, then the process starts over again or stops depending on the members preference. The respondents who use this strategy stated that they do not have bank accounts; they are not members of a savings and credit association (SACCO) or microfinance institution so this is the only way they save and borrow.

While the least (3%) make their dependants work to help supplement their incomes, one respondent who is a casual worker stated that, he was forced to make his two sons drop out of school and look for casual jobs to help take care of the family.

4.4.5 Expenses per year

The graph below shows the workers expenses per year

Figure 20: Workers expenses per year



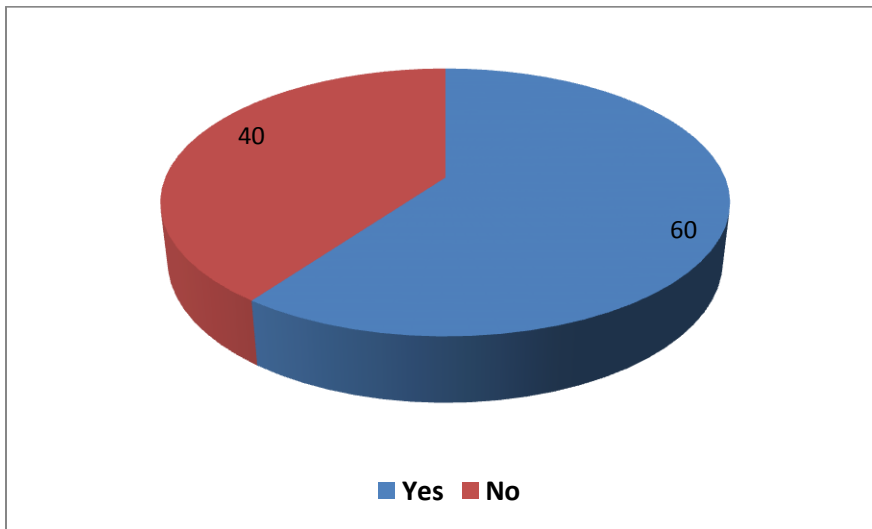
The above graph on expenses per year shows that the income workers receive is spend mainly on food with the average being 30,000 shillings per household, most of the workers gave food as their highest and main expense, the next important expense was housing which was not so high because most permanent and contractual worker are housed by the estate and some casual workers are provided for cheap housing by the estate hence they do not spend a lot on rent. In addition most of the estates are located in rural or peri-urban area where rent is affordable. Transport was the least and the main reason is because workers live within a walking distance from the estate hence they walk to and from work and because of their limited income they restrict their travel. Those whose ancestral home is far from their work places only go home during major events like weddings and funerals and holidays like Christmas.

For savings, only casual workers in the sample that were below 30years and did not have children manage to save. The rest who are the majority are unable to save since their expenses supersedes their income sometimes even making them borrow or engage in other business activities to supplement income. Most permanent and contractual workers are able to save and they attributed this to SACCOs, which deduct the authorized amount from the pay slip before the worker receives it, this has made them improve their living standard. Most of them have been able to buy land, build and educate their children, by borrowing affordable loans from the SACCOs they save in.

4.4.6 Problem with Cash Income

The graph below shows the percentage of workers with income related problems

Figure 21: Income Related Problems



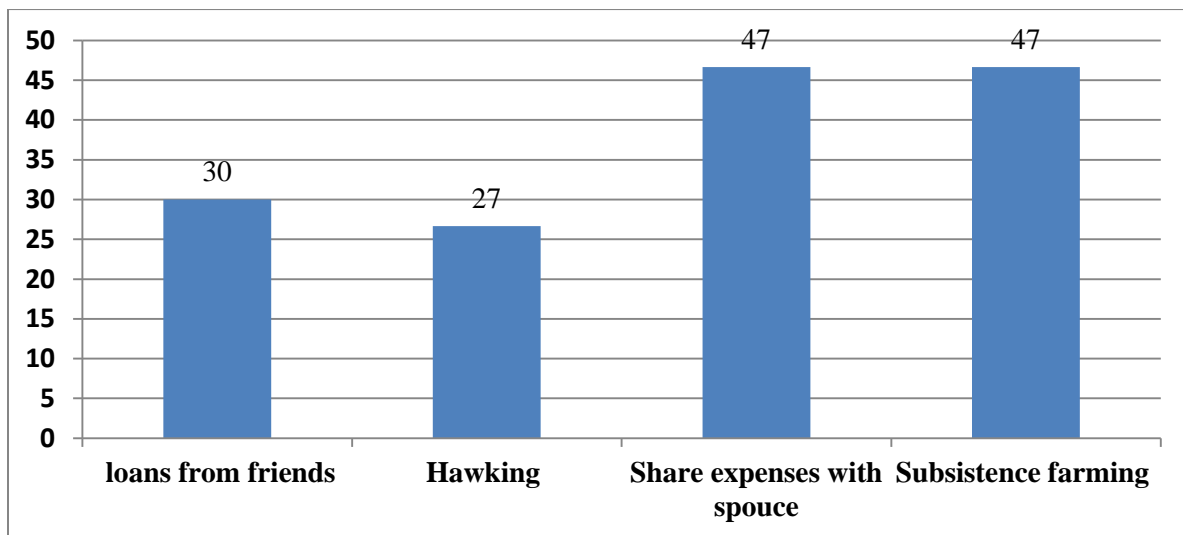
60% of the workers admitted that they had a problem with their income and this is because their income according to them is too low to even cater for their basic needs. With a casual worker getting 220 shillings per day, which is sometimes not guaranteed since at times they do not get

casual jobs in farms especially during the off peak season. 40% were okay with their income stating that it was enough to cover their household expenses and also save.

4.4.7 Solutions Sought for Low Income

The graph below shows the solutions sought by the workers to supplement their low income

Figure 22: Solutions for low Income



Those that had low income sought the above solutions; every person had several strategies of solving the income problem. 47% of workers practice subsistence farming which helps supplement income by forgoing food expenses for some months, this enables them redirect the income to expenses like school fees. Sharing expenses with their spouse (47%) was another strategy they use to supplement income, In the case of a casual worker for example, when one earns 220 shillings per day and they have children to feed, pay school fees and other expenses then it becomes impossible to survive, hence the need for both spouses in the case of those that are married, to work and help each other with expenses.

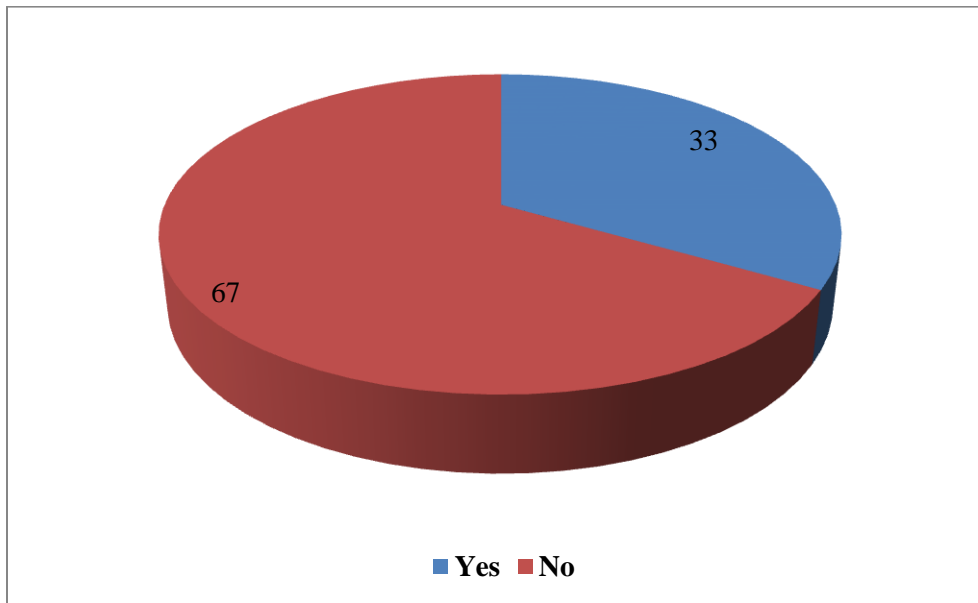
Loans from friends was another strategy and as earlier stated, this is because they do not qualify to get loans from formal financial institutions since they are not members, meaning they do not save or bank with them, and also because most of them do not have collateral to act as loan security. So this leaves them with the option of social security which they get from friends and family. In the case of one worker when his child was send home for school fees he approached his brother for a loan to enable him pay the fees, that was three months back and he has not been able to pay back, but he stated that eventually he will have to pay back, since he does not want to spoil his relationship with the brother. Most of them were not happy with borrowing and one worker captured this sentiment when he said:

“.....when I borrow I feel humiliated, shame and anger, it is like I am a cripple, I depend on everyone and am afraid that one day I will be a burden and no one will be willing to help”

Hawking (27%) is the other strategy of coping with the income problem, this is mainly` done by women, they buy food stuff from the market and sell them in small quantities it was one of the most effective method of supplementing income since the profit got is high the only problem is that most of the time they lack time due to the casual work they do, but admitted if they were able to save enough then they would leave casual work and start their own vegetable vending business. The other type of hawking that they do is selling food, they make food like ‘*chapati*’, porridge, ‘*mandazi*’, tea and other snacks and sell them to fellow workers at the farm and sometimes to construction workers in the villages nearby

4.4.8 Work Preference.

Figure 23: Work Preference

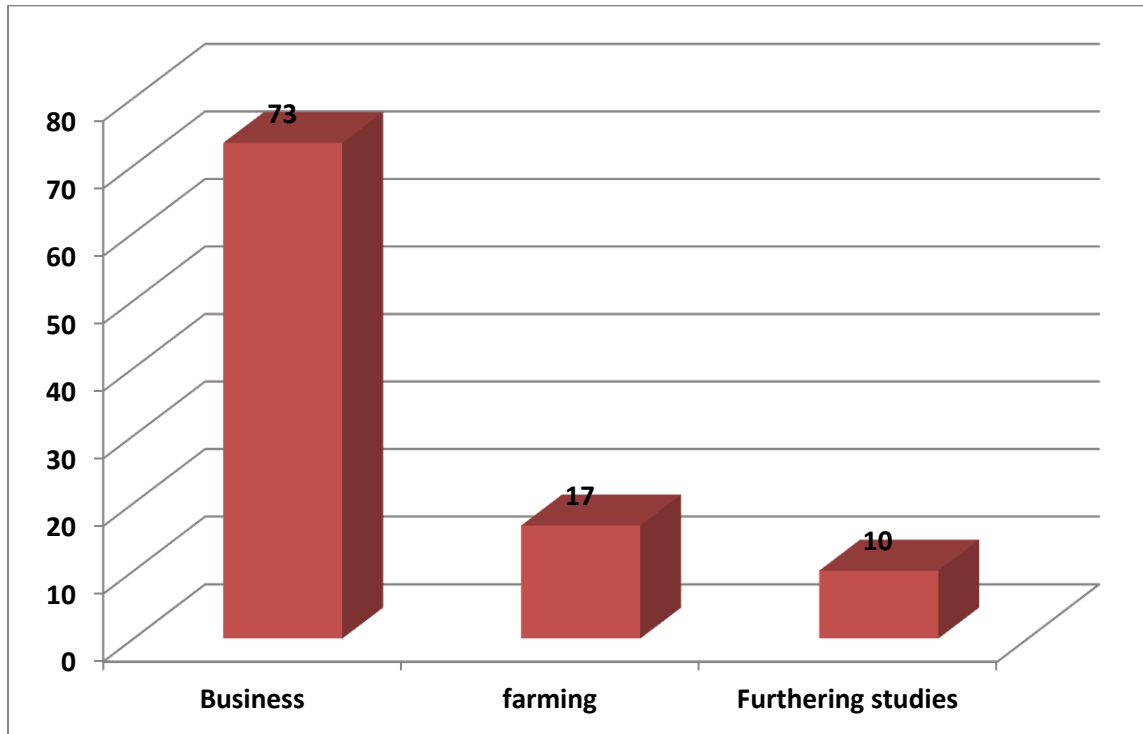


67% of the workers stated that they do not wish to be farm laborers all their life and that they would like to change to something different eventually where as 33% said that they would be farm laborers for life, most of these were people over 45 years of age and to them it seems too late to change into something new, for them the risk is too much and they would rather stick to what they know.

4.4.9 Future Work Plans

The graph below shows the future plans of the coffee workers

Figure 24 Future Plans



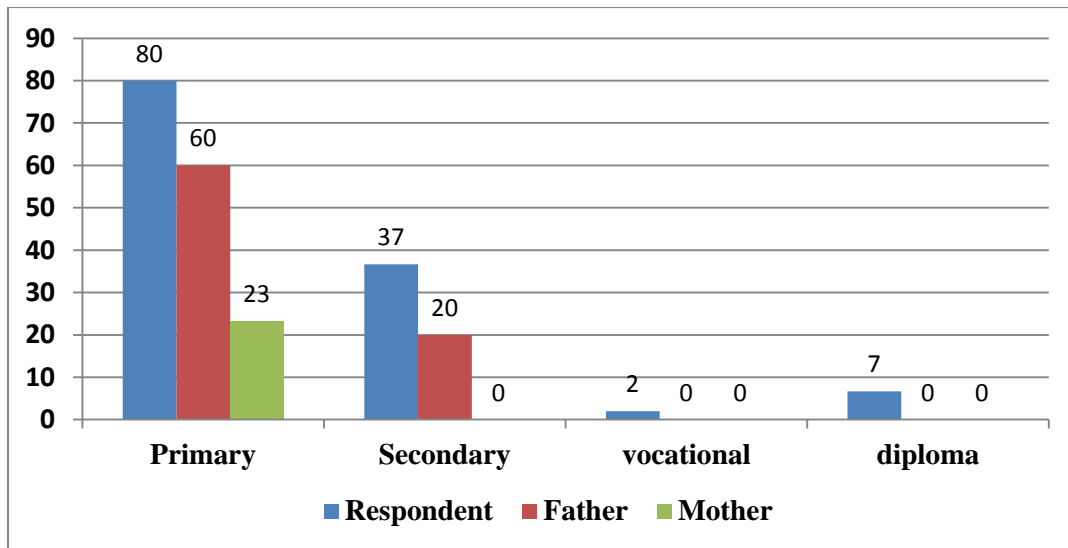
Most of the workers (73%) want to eventually go into business, this is because they consider it more profitable and that it will enable them escape poverty. They all had different business ideas that they wanted to venture in. Farming was the next (17%), those that had farms wanted to start agriculture as a business, since they deem it very profitable and something that they can manage well due to their experiences. Permanent workers were the only ones that stated furthering their studies as an alternative (10%) this is because it would make them get a promotion and also enable them apply for better jobs elsewhere which would mean more income and better living standards. One of the accountants interviewed said that he was already

furthering his studies and at the time of the interview he was in his third year of schooling that is a bachelor degree in business finance.

4.4.10 Human and Physical Capital

The graph below shows the education level of the workers

Figure 25: Education Level of the Workers



Most of the workers that is, 80% have primary school education, the same applies to the respondent fathers that is 60%, and with 23% of them having primary school education. For secondary education, none of the respondent's mother had post primary education while the respondent fathers went up to secondary education. According to the World Bank, parents and the family environment influence the behavior and decisions taken by children. The common view is that more educated parents provide an environment, which improves their children's opportunities and decision processes. This assumption was, for example, the base of World Bank programs to improve female education with evidence that more educated mothers have healthier children. There is also a wealth of evidence on the positive relationship

between parental education, especially mother’s education, and offspring’s education. Policies increasing education appear to have a positive effect on the second generation. This combined with lack of school fees, explains why most of the workers did not go on with post primary education, only a few went to post secondary school (9%).

Figure 26: Physical Capital

The graph below shows the type of house the workers have

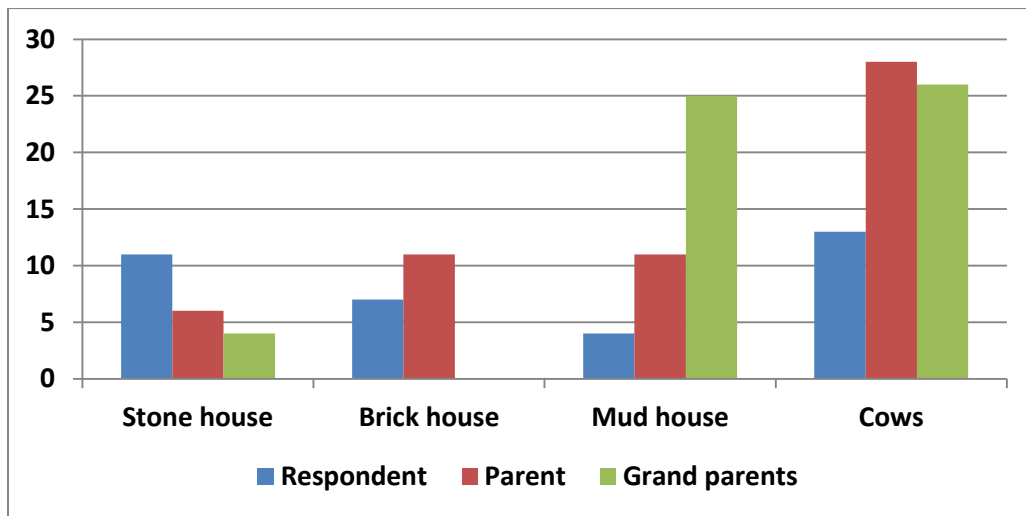
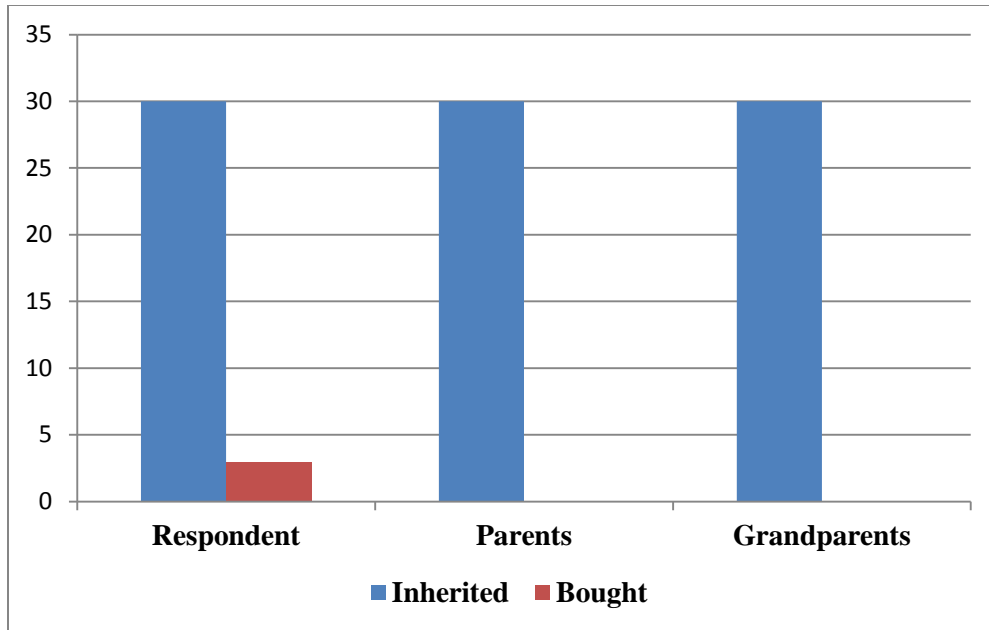


Figure 27: Land Capital

The graph below shows how the workers acquired their land



Most of the land owned by the respondents, parents and grandparents is inherited. 3% of the land owned by respondents was bought, only permanent employees had land that they had bought, none of the casual workers owned land that they had bought and the reason they stated is that land is expensive for them to afford and that they relied on inheritance, which to some is a disadvantage since their ancestral homes are far from where they live so they are unable to use it commercially or for subsistence farming. Other stated that the land they inherited are in arid areas where they cannot grow food and the land is useful for them during their old age when they retire and go back to settle.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a conclusions based on research objectives.

5.2 Conclusion

This project aimed to investigate the spatial and temporal dynamics of coffee estate farming system and livelihood conditions of the workers a case study of Kiambu County. A four months field study of estates in Kiambu County was carried out. The research objectives were to find out the evolution and dynamics of change in terms of land use and agro socio-economic aspects happening in Kiambu; To find out the strategies of owners and managers of coffee estates; to establish the strategies and trajectories of estate employees. A descriptive research design was

followed in which of 16 coffee estates were selected for response to a structured interview guide. Among other findings, results indicate that the farming system of estates has changed, in terms of agro forestry, most estates have moved from full sun coffee to coffee agroforestry and also the land allocated to coffee has reduced since the 1990s.

Results indicate that land under coffee in Kiambu county is reducing due to the estates applying for change of land user to venture into the real estate business which is currently booming in Kiambu County. So unless the government comes in and stops the change of land use, then in some years to come Kiambu County will have very few or no coffee estates. Young people are also less interested to work in coffee farms and those that do work for some years as they save to start their own business hence the government should have incentives for the youths to work in the coffee sector. The workers remuneration is also low and this maintains them in poverty, all the workers interviewed complained of the pay and this has pushed them to supplement their income with other businesses which also are not very profitable since most profitable businesses require huge capital.

The estate owners should also employ more employees on permanent basis to ensure that they enjoy the benefits of permanent employment which would attract more young and educated people to the coffee industry which would at the long term improve the productivity and profit of these coffee estates due to the workers motivation and skill.

REFERENCES

- Bebe, B.O. Udo, H.M.J, Rowlands, G.J. and Thorpe, W. (2003) “*Smallholder Dairy Systems in the Kenya Highlands: Cattle Population Dynamics under Increasing Intensification*”. *Livestock Production Science* 82, Pp. 211-221.
- Chambo, S. A, Mwangi; M. and Oloo, O (2008). *An Analysis of the Socio - Economic Impact of Co-operatives in Africa and their Institutional Context*. Nairobi, International Cooperative Alliance and the Canadian Cooperative Association.
- CRF (2010). *Mapendekezo ya Ukuzaji wa Kahawa*. Second Edition, 2010
- Damianopoulos, R. A (2005). *Market Adaptability, Industrial Divergence and the Politics of Liberalisation in the Kenyan and Ugandan Coffee Industries*. MA Thesis University of British Columbia, Retrieved from ProQuest Dissertations & Theses.

Economic Commission for Africa (2004). The Missing Link in Growth and Sustainable Development: Closing the Gap.

Gamba, P and Komo I (2006). Evolution, Growth, and Decline of the Cooperative Sector.
Working Paper for Centre for Governance and Development, Nairobi Kenya.

Kamau, P.C. (1980). Economics of Herbicide Use in Coffee. Kenya Coffee 45: 111-119.

Karanja, A.M. (1994). Better Coffee Farming. What is Ahead for Coffee Growers in Kenya? An Economic Appraisal. Kenya Coffee, 60: 2051-2057.

Karanja, A.M (2002). Liberalisation and Smallholder Agricultural Development; A Case Study of Coffee Farms In Kenya. PhD Thesis, Wageningen University, USA.
Retrieved from ProQuest Dissertations & Theses.

Karanja, A.M (2002). Coffee Prices and Regulation and their Impact on Livelihoods of Rural Community in Kenya. Tegemeo Institute of Agricultural Policy and Development,
Egerton University - Kenya

Kenya National Bureau of Statistics (2009). Economic Survey 2009. Nairobi, Government Printer.

Kegonde, P (2005). Economic Governance of Coffee Sector; Focus on Central Province.
Centre for Governance and Development, Nairobi Kenya

Kennedy, P. (2005). Royal News. Emeryville, CA. June, 2005.

Lindberg O. (1993). Kenya: Review of the Cooperative Sector with Special Emphasis on Coffee Cooperatives'. in Porvali H. (ed.), The Development Of Cooperatives and Other Rural Organizations, Agriculture and Rural Development Series, No. 8,

Washington, D.C., World Bank.

Lamond, G. (2007). Local Knowledge of Biodiversity and Ecosystem Services in Smallholder Coffee Farms in Central Province, Kenya. Project Submitted In Partial Fulfillment of the Requirements for the Degree of *Master of Science* International Natural Resource Development University Of Wales Bang

Ministry of Agriculture (2011). Economic Review of Agriculture Report. The Central Planning and Project Monitoring Unit, Ministry of Agriculture, Kenya.

Ministry of Agriculture (2007-2008). Gender Assessments Reports. Ministry of Agriculture, Kenya.

Ministry of Agriculture (2010). A Guide for Mainstreaming Gender in the Agricultural Sector. National Agriculture and Livestock Programme, Ministry of Agriculture, Kenya.

NRI (2006). The Potential for Diversification in Coffee Exporting Countries. Project ICO/CFC/10FT. Report prepared for the International Coffee Organization and the Common Fund for Commodities. London: Natural Resources Institute.

Nyangito, H.O (2001). Policy and Legal Framework for the coffee subsector and the impact of liberalization in Kenya. KIPPRA policy paper no.2

Nyoro (1988). Management Practices and Input Usage in Smallholder Coffee Farms in Kenya. Kenya Coffee, 53: 349-359.

Nyoro, J. K. and Jayne, T.S. (Undated). Trends in Regional Agricultural Productivity in Kenya. Tegemeo Institute of Agricultural Policy and Development/ Egerton University.

Nyoro, J.K. (1999). Coffee Production: Its Black Gold Potential Persists. Kenya coffee 64: 2925-2927.

Onchoke, S.N and Nyoro J.K. (1991). Some Socio-Economic Management Characteristics and Factors Influencing Quality in the Kenyan Smallholders Coffee Subsector: 1 – Coffee Deliveries, Processing and Pricing Patterns. Kenya Coffee 56: 1003-1015.

Osorio, N. (2002). Technological Development in Coffee: Constraints Encountered by Producing Countries. London: International Coffee Organization.

Republic of Kenya (2004a). The Cooperative Societies (Amendment) Act, 2004. Nairobi, Government Printer.

Republic of Kenya (2004b). The Cooperative Societies Rules, 2004. Nairobi, Government Printer

Republic of Kenya (1997a). Sessional Paper No. 6 of 1997 On Cooperatives in a Liberalized Economic Environment. Nairobi, Government Printer.

Republic of Kenya (1997b). Cooperative Societies Act, 1997. Nairobi, Government Printer.

Republic of Kenya (2008a). Economic Survey 2008. Nairobi, Central Bureau of Statistics, Ministry of Planning and National Development.

Robert, W. N. (2011) “Emerging Inhibitors of Coffee Yield [Productivity] and Production in Uganda.” Africa Coffee Academy.

Roe J.D.M. and Nyoro J.K. (1986). Economics of Agricultural Production on Small-holder coffee farms in Kenya. Kenya Coffee, 51: 178-192.

Sessional Paper Number One of 1986 on Renewed Economic Growth

Strategy for Revitalization of Agriculture (SRA, 2004). Vision 2030.

Swynnerton, R.J.M. (1955). The Swynnerton Report: A plan to intensify the development of African agriculture in Kenya. Nairobi: Government Printer.

Wanyama F.O (2009). Surviving Liberalisation; the cooperative movement in Kenya. ILO, Geneva Switzerland, Working paper number 10.

Whitaker, M.J (1986). Some Characteristics of Agricultural Production on Coffee Smallholdings in the Main Coffee Growing Districts in Kenya. Kenya Coffee 51: 99-131.

