THE IMPACT OF SOCIO-ECONOMIC CHARACTERISTICS OF WORKFORCE ON PRODUCTIVITY: A CASE STUDY OF CONTRACTED MUMIAS SUGAR OUTGROWERS, WESTERN KENYA.

BY

JUSTUS OTIATO WAFULA
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KENYATTA UNIVERSITY

DECLARATION

I declare that this is my original work and has not been presented for the award of a degree or a diploma in any other university.

JUSTUS OTIATO WAFULA B.A (HONS)

SIGNATURE. DATE 8/11/04

SUPERVISORS

1.  SIGNATURE DATE 08/11/20

Dr.H. K. Rono Ph D.

DEPARTMENT OF SOCIOLOGY, KENYATTA UNIVERSITY

2.  SIGNATURE DATE 8/11/0x

Dr.F. P. Kerre Ph.D

DEPARTMENT OF SOCIOLOGY, KENYATTA UNIVERSITY

DEDICATION

This work is dedicated to my late mother,

Elemina Kakai Weta

For she knew.

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ABSTRACT

The major objective of the study was to examine the impact of socio-economic characteristics of workforce on productivity among the contracted outgrowers of Mumias Sugar Scheme, western Kenya.

Data were collected from Mumias Sugar contracted outgrowers and their workforce based on sample of 30 contracted outgrowers farmers and 90 workers. Sampling was guided by stratified and systematic sampling, while data collection used a survey in which structurerd questionnaires were major data collection tools. Descriptive statistics were used to obtain frequencies, percentages and averages. Inferential statistics including chi-square were used to estimate the differences between groups and the extent to which the observations were significant and can be generalized to the population. Multiple regressions were used to identify impact of the various factors on productivity and other dependent variables.

The findings of the study showed that farmers' age(s), education and work contract are the key socio-economic characteristics that account for productivity in the scheme. More important to the study was the impact of the socio-economic characteristics of the workforce on production and which the findings indicate that workers age(s) and education significantly influence production.

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ABBREVIATIONS/ ACRONYMS

BATS	:	Booker Agricultural and Technical Services.
CDC	:	Commonwealth Development Corporation.
CDS	:	Cane Development Section.
FELDA	:	Federal Land Development Authority.
GDP	:	Gross Domestic Product.
GNP	:	Gross National Product
GoK	:	Government of Kenya.
KSA	:	Kenya Sugar Authority.
KSB	:	Kenya Sugar Board.
KTDA	:	Kenya Tea Development Authority.
MOCO	:	Mumias Outgrowers Company.
MPs	:	Members of Parliament.
MSC	:	Mumias Sugar Company.
NIC	:	Newly Industrialized Countries.
NIE	:	New Institutional Economics.
SOC	:	Sony Outgrowers Company.
US	:	United States.
ZOC	:	Nzoia Outgrowers Company.
PANA	:	Pan African News Agency
KESGA	:	Kenya Sugar Growers Association

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The evolution of sugarcane into a commercialised commodity took a considerable period of time. It is reported to have existed by 2000 BC in the Polynesian Islands of the South Pacific (Hannah, 1996). Later about 630 AD, the armies of the Prophet Mohammed found sugarcane in Persia, and introduced it to the countries surrounding Islamic nations including North-coast of Africa. At that time it was known as the ''Persian reed'' and production of sugar from it was very low since a crude technology system was in use.

On his second voyage in 1493 AD, Columbus precipitated further spread of sugarcane from Canary Islands to New Worlds. In Africa, cane production continued to flourish in Egypt throughout the 1800s and was introduced to Natal in South Africa in 1847 with seeds from Mauritius. After a slow start, the production of sugar in South Africa reached 12,000 tonnes in 1880. At the world scale, sugarcane production reached 33,427 million metric tonnes in 1955 and continued to increase at an annual rate of 2.75% resulting into cumulative increase by a factor of four by 1996 (Hannah, Ibid, 1996).

The same report of Hannah (1996) indicated that in most years, production of sugar kept pace with, or outstripped, World consumption except with 11 years – 1962, 1966, 1972, 1979, 1980, 1986-89, 1993-94. These periods in which

production of sugar was below the demand were reported to have been characterized by unfavourable weather conditions, high wastage and prohibitive prices (Ibid, 1996).

In comparison to the World standards, the sugar industry in Kenya remains considerably small and relatively young as compared to Mauritius, South Africa, Panama, Thailand, Australia, Guatemala, Philippines and Brazil. But the government has since before independence done a commendable effort in its attempt to expand production of sugar through investment in sugarcane production schemes.

1.2 The Sugar Schemes

Sugar has been grown in Kenya on a commercial basis {plantations} since the 1920s with the establishment of two private companies – Miwani (1922) and Ramisi (1937). High domestic demand, fluctuations in world prices, and the need to save foreign exchange and create rural employment led to the establishment of 5 public sugar factories after independence: Muhoroni (1966) Chemilil (1968), Mumias (1973) Nzoia (1978) and Sony (1981). Although public schemes, for the most part, these factories have been managed privately by either Mehta Group International of India {Muhoroni – early period} or Booker and Tate of London (Mumias, Chemilil and Sony) (Barclay, 1977, Buch-Hansen and Marcussen, 1982, Mulaa, 1981).

Of the five public sugar schemes, only Mumias, Nzoia and Sony are based strictly on contract farming, the latter two (much smaller) being modelled after the Mumias scheme. By far, the most 'commercially successful' of all the sugar schemes in Kenya, the Mumias Sugar Company was itself designed to avoid the organisational features of the two public schemes that preceded it – Muhoroni and Chemilil.

From the beginning, both Chemilil and Muhoroni were dependent on a mixture of large and small-scale farms, supplemented by 'factory farms'. The Kenya Government had a majority stake in both companies while management was undertaken by private companies – a West German firm, an American firm and finally Booker McConnell in the case of Chemilil and Mehta Group in the case of Muhoroni. The smallholder farmers at Muhoroni and Chemilil had been organised into cooperative societies charged with supervising the production of the cane and organising the transportation of the cane from the field to the factories. Both these factories operated essentially on 'an estate basis' and they were plagued by numerous problems from the beginning, including: hostile cooperative unions and frequent labour disputes, chronic shortage of cane due to the lack of factory control over cane production, technical difficulties that meant that for much of the 60s-70s the two companies were operating below capacity. This led to delays in harvesting and lower returns to farmers as the cane not only lost weight but also its sucrose content (Ayako, 1989, Barclay, 1977).

Meanwhile, there was a dramatic fluctuation in the world market price of sugar in the early 1970s, but the satisfaction of consumer demand remained a top political priority for the government. The situation was accentuated by the collapse of the sugar industry in Uganda (from where Kenya had previously imported the bulk of its sugar) following the rise of Idi Amin in 1971. It was partially against this background that the Mumias scheme was founded along lines different to previously existing sugar schemes in Kenya. This is because the importance of sugar in the Kenyan economy is due more to political considerations and consumer's taste than to any inherent qualities of sugar, as the product has no nutritive content. The argument usually used to defend efforts aimed at ensuring self-sufficiency in sugar/construction of sugar schemes is that it saves 'precious foreign exchange'. As Barclay (1977) argues, this view is consonant with the perception that the government would have no alternative but to import the equivalent amount of sugar, yet the decision to commit foreign exchange resources to the purchase of sugar is a reflection of a particular policy and is therefore reversible. In any case, as early as the 1960s, the Soviets (1964) and the Chinese (1966) had offered to build a sugar factory at Mumias but the government had turned down their offers for purely ideological reasons (Mulaa, 1981).

During the period 1965-70, Bookers Agricultural and Technical Services (BATS) carried out a feasibility study and operated a pilot scheme for cane growing near Mumias Township. They concluded that the crop could be commercially grown here and the government accepted the findings of the

study in 1971. The scheme became operational in 1973. BATS proposed to create a sugar scheme that would be spared the chronic undersupply of cane. Thus, the Mumias Sugar Company (MSC) was formed with a completely new organisational structure of production, namely, the combination of smallholder contract outgrowers' which is the focus of this study, a nucleus estate, and a factory. The Kenya Government took 69% of the shares, the CDC 12%, while Booker McConnell took 5% of the shares and management of the company (Ayako, 1989). Booker was particularly interested in the managerial role arguing that 'access to capital was no longer a serious problem for developing countries and that the scarcity of skilled management was the principal issue confronting them' (Barclay, 1977).

The Kenya Government stake in the company was financed through a soft loan of £2.9 million from the British Government, representing at the time, the largest commitment of British aid funds to any single project in Kenya excepting the Land Reform Programme (Ibid). Under the terms of the Agreement, BATS provides technical management for which it is paid on an annual basis. The MSC quickly acquired two distinguishing features: its inclusion of smallholder contract outgrowers' and the high degree of centralization, which increased control that characterize the smallholder sector.

The company surveys the farmer's land to ensure its suitability and then signs a contract between the company and an individual contracted outgrowers' for

a minimum period of 5 years. The company, ploughs, harrows, furrows the plot and even provides labour for weeding in case a contracted outgrower fails to do so at stipulated time. The company also supplies fertilizers, seed cane, cane harvesting, stacking, loading and tractors for transporting the cane. The company has field supervisory staff that monitors each contracted outgrowers' performance constantly. All these services are provided to the farmer on credit and are charged to him immediately he harvests and sells the crop. An interest of 8% per crop is charged on all credit services (Ayako, 1989). The contract stipulates that the contracted outgrower must sell his cane to the company although it does not oblige the company to buy all the cane the farmer produces (Ibid, 1989).

There is very little role for contracted outgrower in the scheme apart from following instructions, supplying their land and labour. In 1973, the Ministry of Agriculture announced the formation of a limited liability company called Mumias Outgrowers Company Limited (MOCO) to organise contracted outgrower production, with a loan from the CDC. The management of the MSC and government representatives' together hold a majority votes on the board of directors of MOCO, other directors are elected by contracted outgrowers' to represent various growing zones. By design and structure therefore, the role of MOCO was charted by its financial sponsors rather than smallholder growers whose interests it represents. It was not intended to be a mechanism for mobilisation of collective action by contracted outgrowers'. The MSC sets the prices for the services and inputs it provides, MOCO

reimburses the MSC for these and passes the charges on to the contracted outgrower, adding a levy of its own, initially to pay off the loan advanced by the CDC and the Government (Barclay, 1977).

Like with the KTDA, the Mumias Sugar Company applies stricter standards on the contracted outgrower sector than on its own nucleus estate. For instance, on the company's nucleus estate, the cane is burned immediately prior to cutting to eliminate leaves and grass and to enable the harvesting process to proceed faster and at a cheaper cost. By contrast, contracted outgrower cane is harvested 'green', which, is more expensive and takes longer. The company discourages burning on contracted outgrowers' farms because it would be much more difficult to regulate. This is disadvantageous to the contracted outgrower in many ways. The cane might be burned before its full maturity if the contracted outgrower required cash immediately but the company imposes a penalty on all burnt cane without regard to the cause of burning and payment is not made until the end of the scheduled crop cycle – some 20 –24 months later. Other problems have included delayed harvesting, unilateral price increases, and inability to purchase all the cane produced by farmers. This was particularly acute in the late 1970s, forcing a presidential directive to all sugar factories to collect all cane produced by farmers even if that meant that the factories would have to work all year round (Currie & Larry, 1987, Owino, 1991).

1.3 The Sugar Industry in Kenya: 1980s – 2002.

Despite efforts by the government to attain self-sufficiency in sugar cane production through the construction of sugar factories, sugar production in Kenya still falls far below domestic demand as shown in appendix 1. This is partially attributable to a number of problems, most of them relating to the operations of the existing sugar schemes. Because of its commercial orientation, modern technologies, fixed prices; the Mumias Sugar scheme started out by making 'impressive profits'. This convinced the government to model new factories after Mumias and through a World Bank funded Sugar Rehabilitation Project in the 1980s, to restructure old companies after the Mumias Model as well (Buch-Hansen & Marcussen 1982). Thus, every scheme came to have an outgrower company viz: Sony Outgrower Company (SOC), Nzoia Outgrower Company (ZOC), Chemilil Sugar Outgrower Company (CHESOC) and Muhoroni Sugar Outgrower Company (MUSOC) all dominated by representatives of the government and company management and charged with the management of the smallholder sector, while the various 'main' companies ran nucleus or factory farms.

A bureaucratic-private management complex came to run the sugar industry. This consisted of an inter-ministerial team consisting of the Permanent Secretaries for Treasury and Agriculture, the Director of Agriculture, the Commissioner of Cooperatives, the Attorney General and the factory management (*Daily Nation, 2002*). Civil servants were employed as directors

of various government-owned, but privately managed sugar schemes. These civil servants were always in tandem with the views of private managers.

The result was a highly centralised and heavily controlled/regulated industry in which the government and the millers, using their majority shares and control of farmer organisations basically imposed managerial, production, marketing and pricing policies on farmers – prompting farmers to engage in subversive activities like arson, selling off fertilisers, poaching, uprooting cane, boycotting harvests or simply substituting cane production for subsistence crops (*Daily Nation, Various issues, East African Standard, various issues*).

Under this bureaucratic-private management administration, all except Mumias and Chemilil factories went technically bankrupt, the proportion of proceedings of the sale of the cane crop taken up by sugar factories, outgrower finance companies/cooperatives and the government were always larger than that which went to farmers. For instance, smallholder farmers at Nzoia Sugar Company pay Nzoia Outgrower Company 1 percent capital levy, 4 percent administrative fees, Kenya Sugar Board loans of which are charged 17 percent interest and 15 percent retention fund. In addition, they also pay local authorities, 18% value added tax, 7% development levy, 2% presumptive income tax and 1 % cess (*Daily Nation, 2002*). By 2000, on average, farmers received Kshs 1730 (23 US$) per tonne of cane. From this, the factory deducted the cost of farm inputs and hired labour, leaving the farmer with

Kshs 380 per tonne of cane (5 US$) (PANA, 2000). It is from this small amount of money (KESGA, 1999) that the farmer has to cater for his/her family and workforce. This leaves the farmer with little option other than to underpay workforce. Yet despite all these charges, the factories have not invested in modern technologies, transportation, storage and distribution facilities, neither have they experimented with new plant varieties, better pesticides, chemicals, et cetera. Payments are often delayed, collection of sugarcane is never guaranteed and prices are often arbitrarily changed.

These problems led to the enactment of the controversial Sugar Act in December 2001. Sponsored by 18 members of parliament (MPs) drawn from sugar growing areas, (The Sugar Parliamentary Committee) the Act sought to rectify this imbalance of power in the Sugar Industry. Thus, the Act provided for 51% shares for smallholders in the privatised sugar factories, 51% smallholder representation on the boards of directors of milling companies, a 15-Member National Sugar Board to oversee the industry, with 7 elected farmer representatives with a non-executive chairman elected from among the representatives of the 15 member board, the remaining seats being divided between representatives of factory management and the government (GoK, 2001). The Sugar Act of 2001 also sought to free the outgrower from exploitation by establishing how an outgrower could terminate a contract with an outgrower company, separating production and milling functions, basing prices on sucrose content rather than weight, allowing for farm gate weighing rather than factory weighing – therefore the farmer does not bear the cost of

transportation slippage (inconsistent with a payment system based on sucrose content), among others.

The Sugar Act of 2001 lays a lot of emphasis on the new Kenya Sugar Board. For instance, the KSB is charged with the responsibility of designing a sugarcane farming contract, providing for the terms and conditions of production of sugarcane and sugar and prescribing the rights and obligations of growers and millers, licensing sugar mills and jaggeries. It is these new powers of the board and the fact that it has a smallholder majority that has forced the government and factory management, previously the dominant players in the sector to reject the Act and push for its amendment. The Act received Presidential Assent in December 2001 and a few days later the Chief Executive of Mumias Sugar Company announced that the company would ignore the Act. Shortly afterwards, all the sugar factories produced a document proposing 74 amendments to the Act. In sum, they sought to reject the Act in its entirety, in particular calling for farmer representation at the KSB to be reduced from 7 to 4, rejecting the 30-day mandatory period for payment to farmers after cane delivery demanded by the Act, the reduction of the percentage of shares to be owned by farmers and the abolition of both payment on the basis of sucrose content and farm gate weighing of harvested cane.

On April 23 2002, the Minister of Agriculture tabled in Parliament the Sugar Amendment Bill 2002 with all these recommendations put forward by the

sugar companies despite the fact that the Bill had hardly become operational. This caused widespread riots in sugar schemes across the country. It is important to note here that the sugar companies are in fact government owned with civil service based boards of directors and private factory management. There was therefore a discernible struggle within the government as well as pressure from farmers and Booker Tate (through their lobbyist, East African Association), which was fighting for the status quo. The Bill has stalled in parliament due to opposition from politicians from sugar growing areas and the factories have been implementing it selectively.

Like the KTDA, the MSC, indeed most of the public sugar schemes in Kenya started out with an ideological commitment to smallholder bias. Over time however, commercial bias as well as bureaucratic and political interests/struggles, amongst other factors, relegated this ideology to secondary consideration. Through a centralised system of control driven largely by private commercial and personal interests on the part of state institutions or individual politicians and bureaucrats, the schemes came to adopt and implement policies and practices that would appear to seriously undermine the so called commitment to smallholder welfare. But because policy is a social and political process fraught with continuous negotiation and conflict (Mooij, 1999), changing socio-political and economic relationships have forced or rather are forcing changes in the operations and orientations of these schemes.

Given that the sugar schemes are all modelled after the Mumias Sugar Company, which accounts for over 60% of all sugar produced in Kenya (KSB, 2002), this research focused on the MSC, although complementary evidence is sought from the other schemes, where necessary. MSC depends on over 49,000 hectares of cane with 90% of this land belonging to over 45,000 contracted outgrowers and the other 10% belonging to the company as the nucleus estate. The company recommends that 20% of the farmers' land remains for food production and the remaining 80% to be used for cane farming. (Op cit. 1977).

Following the above observations, this study examined the socio-economic characteristics of the contracted outgrowers' workforce and investigates their influence on productivity. The analysis of the impact of these characteristics on productivity may be the building block to enhancing sugar production and fruitful to the policy makers, planners and sugar schemes managers and their companies.

1.4 Statement of the Problem

The problem in sugar sub-sector is continued decline in productivity, wages and incomes as well as employment opportunities. Much of the research and literature on contract farming in Kenya, and specifically Mumias Sugar Scheme, have given limited attention to the socio-economic characteristics of the workforce. Much of the previous studies (Barclay, 1977; Ohkura 1995; Nasongo 2000; Wanjawa 1999, Esese 1992; Rakama 1996) show little or

nothing at all on how characteristics of the workforce influence productivity. These studies have been concentrating on the technical-agricultural and market (economic) factors of contract farming. And yet the productivity of contract farming schemes and the degree to which they are viable and equitable depends as on non-market (socio-political) factors as on economic factors or the interaction of the two (Carney, 1994, Daddieh, 1994, Goldsmith, 1985, Grosh, 1994, Korovkin, 1992, Raynolds 2000, White, 1997).

In the Sessional Paper No. 4 of 1996, the Kenya Government adopted a policy initiative to attain status of newly industrialized countries by the year 2020 in which one of the pre-requisites is to realize self-sufficiency in agricultural production through a motivated entrepreneurship and workforce. As noted above, limited attention has been given to characteristics of the contracted outgrower contract holders, as entrepreneurs, and their workers as the direct producers.

The purpose of this study was to determine the influence of the socio-economic characteristics of the workforce on productivity in the Mumias outgrowers Sugarcane Scheme.

1.5 Objectives of the Study

The objectives of the study were the following:

1. To identify the trends in sugarcane production both national and Mumias.

2. To examine how the socio-economic characteristics of the contracted outgrowers in Mumias sugarcane scheme influence productivity.
3. To examine how the socio-economic characteristics of the workforce in Mumias outgrowers Sugarcane Scheme influenceproductivity

1.6 Research Hypotheses.

The research hypotheses for the study were:

1. That socio-economic characteristics of the contracted outgrowers influence productivity
2. That the socio-economic characteristics of the contracted outgrowers influence characteristics of the workers
3. That the contracted outgrowers workforce socio-economic characteristics influence productivity.

1.7 Assumptions

Assumptions are made in this study that there will be access to the contracted outgrowers and more importantly their workforce .It is also assumed that there will be access to the basic records of the contracted outgrowers like delivery notes. Assumption is also made that the contracted outgrowers' will allow an opportunity for interview and that of their workforce.

1.8 Importance of the Study

The problem under study has received minimal attention and this merits its present study. While fairly accurate records exist of the number of tonnes of sugar marketed or the value of export sales from the sector, vast number of rural workers are unmonitored and their social and economic characteristics and conditions remain unmeasured (Loewenson, 1992). Turner et al (1992) reported a case of conflict (and/or competition) between cash and subsistence crops in which Maragua women refused to produce coffee and instead produced bananas for local consumption and sale. A similar case was also reported among Mwea women who refused to maintain rice plantations and opted for vegetables and fruits for local consumption and sale. The observations from the above suggest that lack of control on earnings by family members, who double up as labour, creates conflicts that have implications for productivity (Sorrenson, 1988).

The contracted Mumias sugarcane outgrowers produce the bulk of sugar in Kenya; 60% of the total Kenyan production (Ibid., 1999). The current research therefore attempts to contribute towards the building up of a body of knowledge on the impact of socio-economic characteristics of workforce on productivity particularly in Mumias scheme, which is the model of sugarcane schemes in Kenya. The findings of this study may be of interest to the following:

i) The policy- makers concerned with raising sugarcane production for the nation and export.

ii) Business executives concerned with enhancing efficiency and hence profitability.

iii) Outgrowers and their workforce concerned with equitable benefits.

iv) The study will possibly provoke further academic research among social scientists interested in the field of social organization and change especially within the context of contract farming.

1.9 Scope and Limitation

This study is limited to the contracted outgrowers of Mumias Sugar Scheme and their workforce. One of the limiting factors affecting this study is time, given that it is an M. A. thesis expected to be complete within two years, it is not enough to cover the whole sector; financial constraints in terms of acquiring the necessary instruments that will facilitate research on such a vast scope and finally the Kenya Sugar Board, Mumias Outgrowers Company and the Cane Development Section of Mumias Sugar Company have problems with documentation of data on farmers.

1.10 Definitions of Concepts and Variables

Booker Tates	:	British international agricultural managing agent.
Contract farming	:	Production system that consists of an agreement between a farmer (grower) and contractor (these could be processors, exporters, agents or state corporations). This contract binds both parties to specific obligations.
Contract holder	:	Those outgrowers who have entered into contract with Mumias Sugar Company.
Micro-entrepreneur	:	Individuals engaged in pseudo business activities.
Nucleus Estate:		These are the large sugar cane plantations around the factory owned by the Mumias Sugar Company.
Outgrower	:	The small holder sugarcane farmers who supply cane to Mumias Sugar Factory.
Plant cane	:	This is the first cane crop that is to be harvested.
Ratoon cane	:	The subsequent regrowths after the first harvest of the cane crop.
Subsistence farming	:	Farming basically for home-food consumption.
Workforce	:	Those men, women and children engaged in manuallabour within the outgrower sugarcane farms.

Productivity : The yield of sugarcane per acre measured in tones

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL PERSPECTIVE

2.1 Literature review

2.1.1 National trends in the agricultural sector

Agriculture has long been the backbone of the Kenyan economy. Currently, the sector constitutes 25 % of the country's Gross Domestic Product (GDP) and provides employment to about 80% of the population (Gatheru & Shaw, 1998). Unlike in most African countries, until the late 1980s, by most accounts, (Bates, 1981, 1989, Lele, 1989) Kenya's agricultural sector was regarded as generally successful and in the Sessional Paper No. 2 of 1996 on Industrial transformation to the year 2020, it was indeed observed that Agriculture will play a pivotal role in enabling Kenya join the league of newly industrialized countries (NIC). Self-sufficiency in basic foods was a major policy objective of the government towards this end. Second, increased production particularly that of small holders, will lead to rising incomes and in turn to increased consumption and savings, both of which are pre-requisites for an expansion of the industrial sector. Third, increased export-crop production will increase foreign exchange earnings to finance the importation of intermediate or capital goods, especially in the early stages of structural transformation when manufacturing is a small portion of economic activity.

Yet agriculture's average contribution to GDP is on the decline in the following years respectively as shown in the table below:

Table2.1: Agricultural Contribution to GDP

Year	1974-76	1977-80	1981-85	1986-90	1991-94
Contribution	35%	34%	33%	31%	28%

(Sessional Paper no. 4 of 1996).

Fourth, increased primary production will stimulate forward linkages with other sectors of the economy through demand for transport, services, marketing and processing as well as some backward linkages in the form of farm inputs and equipment. (Sessional Paper No. 2 of 1996, Sessional Papers Nos. 1 and 2 of 1994).

It was projected that by the year 2020, the number of employees found in the agricultural sector will increase significantly in absolute numbers from six million persons to nine million persons but reduce proportionately to the performance of other sectors of the economy from 66% to 50%. The goals of accommodating this increased employment and increasing production will only be achieved through increased productivity.

The position of the government is that for this to succeed the emphasis throughout will be upon smallholder production and only where estate production has a proven economic advantage will large-scale units be encouraged. In addition, there is need to transform our present smallholder agriculture from its current status of being a cultural practice or way of life,

into smallholder farm enterprise (Fifth National Development Plan 1984 – 1989).

Less than ten per cent of the working populations are registered trade union members. The much greater number of rural people, who are relatively worse off to start with, are not organized so as to be able to bargain effectively for their share of national income. The government has a duty of safeguarding the interests of the rural population and exercising a positive influence in favour of rural incomes (ibid). It is in this logic that this study set out to identify the characteristics of the workforce in rural agriculture. While there have been a number of problems with different crops cultivated under different types of farming arrangements, the crisis seems to have been more prevalent and pronounced amongst contract farming schemes.

Kenya has one of the most extensive contract farming schemes in Sub-Saharan Africa covering close to half a million farming households involved in the contract production of such crops as sugarcane, tea, coffee, tobacco, horticulture, barley and rice. This institutional arrangement continues to expand in Kenya with contract schemes having developed for a wide range of industrial and exports crops since the 1960s. For instance, it currently accounts for 60 percent, 57 percent and 80 percent of sugar, tea and tobacco production in Kenya, respectively (KSA, 2002, KTDA, 2002).

2.1 .2 Definitions and Typologies of Contract Farming

Contract farming exists in many forms and has been defined variously by scholars. Nigel Key and David Runsten (1999: 382) define it as 'an intermediate institutional arrangement that allows firms to participate in and exert control over the production process without owning or operating the farms'. This definition is derived from the theoretical premises of New Institutional Economics (NIE) that conceives of contract farming as an institutional response to market imperfections- incomplete or lack of markets for credit, factors of production, information, insurance, et cetera, and high transaction costs associated with searching, screening, monitoring and bargaining with clients (Doward, et al: 1998). Pari Baumann (2000, 7) defines contract farming as a 'system where a central processing or exporting unit purchases the harvests of independent farmers and the terms of purchase are arranged in advance through contracts'. This definition describes only a particular form of contract farming, for as a review of the literature shows, farmers can be linked to agribusiness firms by contracts affecting production, markets, management, or all of the above (Ayako et al. 1989, Glover & Kusterer, 1990, Watts & Little, 1994).

The definitions of contract farming are varied because contracting occurs in different forms and involves different actors. The only structural commonality in contract farming is the existence of a contract between the contracted outgrower and the agribusiness firm. The content of the contract will vary greatly but typically, the grower provides land, labour and sometimes tools but

is supplied with inputs like fertilizer, seeds, insecticides, credit as well as extension and or transportation services by the agribusiness firm with whom he or she contracts. Additionally, prices, quality, standards, quantity to be supplied, the technology to be used, the crop to be cultivated and work routines are often predetermined before planting with the grower's task mainly centred on harrowing, weeding, applying fertiliser and chemicals, harvesting and abiding by the rules of the contract.

Given the diversity of actors involved in contracting, and the different forms of contract schemes, scholars have typically classified the process on the basis of types of contract specifications or actors involved. Based on the types of contracts, Nicholas Minot {1986} has classified contract farming into three, not mutually exclusive groups:

i) Market specification contracts – pre-harvest agreements that bind the firm and the farmer to a set of conditions governing the sale of the crop, including specified prices, quality and timing
ii) Resource specification contracts – oblige the firm to supply inputs, extension, credit, et cetera in exchange for a marketing agreement
iii) Production management contracts, which typically bind the farmer to observe a particular production method or input regimen, usually in exchange for a marketing and/or resource provision.

In practice, these contract forms may be employed in various combinations, and within these broad categories, firms must specify terms that include price

determination formulae, husbandry or production techniques, market control and other regulations concerning credit and other inputs and services to be supplied (on loan), loan repayment procedures, etc, in their contract designs or terms.

Based on the type of actors involved, David Glover and Kenneth Kusterer, (1990) classify contract farming into three main groups:

i) Outgrower schemes: Glover & Kusterer use this term to generally connote a government scheme with a public enterprise purchasing crops from farmers, either on its own or as a joint venture with a private firm. These schemes typically provide production and marketing services to farmers on their own land or on government land designated settlement schemes' where the growers are either tenants or licensees.

ii) Contract farming' schemes: Glover and Kusterer use this term to refer only to contractual arrangements between private agribusiness firms and contracted outgrower. Contract specifications may vary but farmers operate on their own lands, with few exceptions where the land may belong to the state.

iii) Multipartite Arrangements: refers to schemes that involve many actors, for instance the state, private agribusiness firm, international aid agencies/donors, and smallholder farmers.

This study uses the term contract farming to refer to group three of the above.

2.1.3 History of contract farming

While contract farming has undergone rapid expansion in the developing world in recent years, it has been practised in the developed world since its origins in the 19th century United States with the contract production of sugar beets and cling peaches (Key & Runsten, 1996, Warning & Soo Hoo, 2000). In the developing world, the practice dates back to the 1940s-60s in Latin America, Asia and Sub-Saharan Africa. Amongst the earliest examples of contract farming schemes in these regions include: the Compania Chilena de Tobacco scheme in Chile (1940s), Federal Land Development Authority (FELDA) rubber and palm oil schemes in Malaysia, (1956), and the Kenya Tea Development Authority (KTDA) tea scheme in Kenya (1960).

The evolution of contract farming in these regions at this time was motivated by both political and economic factors. In Latin America, the period following the Second World War was characterized by import-substitution policies and nationalistic pressures that made foreign ownership of land and plantations untenable. In addition, the market for fruits, vegetables and other agricultural produce in neighboring North America was increasing rapidly, and wages were lower in Latin compared to North America. Multinational food processors set up operations in Latin America and adopted contract farming, in light of the political and market constraints imposed by the political and economic conditions obtaining in both Latin and North America. They were supported by governments in favour of the import-substitution policies whch saw contract-farming as a way of achieving self-sufficiency in food

production, and by local owners of capital who stood to gain from this fusion of international and domestic capital (Key & Runsten, 1996, 1999, Korovkin, 1992), through joint-venture schemes.

In Asia and Africa, the political and economic pressures occasioned by the decolonisation process provided the initial motivation for the process. The FELDA scheme in Malaysia, for instance, is a public project that was intended to settle new lands and to create a prosperous export –oriented Malay peasantry, much like the KTDA that was created in an attempt to not only reduce political pressure on the colonial/postcolonial state emanating from issues related to land and the prohibition of African cultivation of cash crops, but also to produce a petty-capitalist African agriculture capable of absorbing potentially rebellious landless Africans as wage labourers and also making the country less dependent on external assistance(Baumann, 2000, Swainson, 1980). Since the 1980s however, the growth of contract farming in the developing world has been fuelled by agrarian reforms, neoliberal policies such as privatisation and liberalisation programmes that have swept many parts of these regions in recent years, as well as changes in the organisation of major agro-industrial firms and food processing and marketing chains (towards sub-contracting) (Korovkin, 1992, Little & Watts, 1994 White, 1997). For instance, there was an explosion in the growth of contract farming scheme in Chile during the military dictactorship of General Pinochet (1973-89), due to his neoliberal economic policies and the agrarian reform programmes that preceded them.

2.1.4 Social and Economic Implications

Whether in the industrialised world or in developing countries, contract farming has always generated controversy regarding its social-economic implications. In the United States (US), this controversy has centred on concerns that agribusiness firms exploit farmers with whom they contract due to disparities in bargaining power and market information between the contracting companies and individual farmers, among other factors (Boehlje et al., 2001, Roy, 1972). This controversy has dogged contract farming in the US since the late 19th century when problems of monopsony and oligopsony by food processors and marketers prompted US Congress to enact a series of laws aimed at increasing the bargaining power of farmers and providing legal frameworks through which contract farming disputes could be resolved. These include, The Capper Volstead Act of 1922 which exempted agricultural cooperatives from anti-trust laws, so as to increase the power of cooperative bargaining associations, The Sugar Act of 1934 which established farmer bargaining associations for sugar beet growers, The Agricultural Marketing Act of 1937, The Agricultural Fair Practices Act of 1967, The Uniform Business Code, and The Perishable Agricultural Commodities Act, all of which provide a legal framework in which to resolve disputes over contracts, to bargain over prices and contract terms, or for the farmers themselves cooperatively to process agricultural products (Key & Runsten, 1996). As recently as 2001, sixteen State Attorney Generals in the United States drafted for state legislation, a Producer Protection Act designed to protect farmers from perceived exploitation by agribusiness firms, suggesting that the

controversy surrounding contract farming in the US is still far from over. Senator Tom Harkin of Iowa introduced the same legislation in the United States Senate last year despite claims by opponents who argue that such legislation would reduce the competitiveness of the grain and livestock industries that rely largely on contracting, and that it is impossible to write long-term contracts that will meet all contingencies (Boehlje et al., 2001).

Concerns about the social and economic implications of contract farming in the developing world have been more diverse, urgent, and perhaps serious than in the industrialised world partly because of the rapid expansion of contracting in recent years (largely through foreign capital), and partly because of the stage of Third World development, and the perceived contribution, or lack thereof, of contracting to national or rural development. Central to these concerns is the debate which revolves around the degree to which contract farming can be viewed as a dynamic partnership between smallholder growers and agribusiness firms benefiting both without sacrificing the rights of either or the degree to which it can be seen as an asymmetrical relationship of exploitation. In the first instance, contracting has been viewed as a mutually beneficial institutional arrangement that introduces the smallholder grower to modern technology and managerial skills, high-value export crops, lucrative markets, cheap credit and regular cash flow, and enables the agribusiness firm to access cheap land and labour, raw materials of acceptable quality and quantity, reduce market risks by shifting part of it to growers and political risks through 'indigenization' (Glover & Kusterer, 1990, Lamb & Muller, 1982, Senanayake, 1995, World Bank, 1981, Williams &

Karen, 1985). In the second instance, contracting is viewed as an exploitative relationship in which agribusiness firms, due to their command of markets, control of credit facilities and technical skills, lobby power, et cetera exercise disproportionate power in bargaining and use it to exploit growers by:

i) Shifting market and production risks to the grower through price determination formulas

ii) Shifting the burden of quality and quantity standards to the grower through labour practices and husbandry techniques that utilise grower labour more intensively (longer hours) and extensively (unpaid household/family labour) (Porter & Phillips-Howard, 1995,1997).

iii) Restricting the grower's right to alternative uses of his land and labour thereby reducing him to a mere wage worker as he becomes a defacto owner of his land and labour, with the contract imposing on him managerial, technical, production and marketing directions which may not only 'de-skill' and alienate him from his product but may also undercut his benefits from the scheme and other alternative economic activities (Clapp, 1994, Dinham & Hines, 1983, Lappe & Collins, 1977).

iv) Substituting food production for cash crop production leading to food shortages and poor nutrition {Lappe & Collins, 1977, Braun & Kennedy, 1994, Little & Watts, 1994, White, 1997}.

v) Encouraging poor husbandry practices like mono-cropping, deforestation, production and processing practices, which create

pollution leading to environmental degradation in grower villages (Ibid.)

vi) Increasing socio-economic differentiation among the peasantry by either excluding small scale and poorer farmers or by disintegrating the peasantry through the creation of a peasant capitalist class, which then works against the interests of rural peasant farming community (Korovkin, 1992).

A sub-set of this debate has been the controversy regarding factors that determine the evolution, viability, productivity and equitability of contracting.

Neoclassical economists and those who view contracting as a dynamic partnership benefiting both sides, usually argue that contract farming is largely determined by market forces, and the technical characteristics of the crops involved. Proponents of market-based determinants of contract farming argue that contracting is mainly determined by the nature of high-value crops – capital and technical requirements needed for the profitable production of high-value {export} crops, coupled with the underdevelopment of factor and product markets in the developing world (Minot, 1986). According to this 'technological or commodity determinism theory', it is market structure (imperfections) and technical characteristics of high-value export crops such as sugarcane, tobacco, tea, et cetera that attract smallholder growers to contracting. The market structure can take the form of poorly developed capital or credit markets, natural or legal monopolies and monopsonies,

underdeveloped markets for products, information (extension services), labour, and land, as well as the presence or absence of alternative production or exchange arrangements such as plantations or spot markets.

Technical characteristics include the need for processing and quality control, which necessitate the use of expensive machinery, and the perishability or bulkiness of produce that requires readily accessible and/or secure markets. Growers therefore enter contracting in order to access credit, inputs, extension advice, markets, adequate output, regular income and other benefits that they would not otherwise obtain. Agribusiness firms on the other hand, are drawn to contracting by the need to access cheaper household land and labour, regular supply of quality raw materials, adequate, timely and quality output, and higher profits than would otherwise obtain under alternative production arrangements such as vertical integration or spot market transactions (Goldsmith, 1985, Minot, 1986, Raynolds, 2000). According to this school of thought therefore, contract farming is a bargain freely made between equal partners on the basis of constraints imposed on them by market structures and technical characteristics of crops.

The opponents of the technological determinism school, cite empirical evidence from countries in Sub-Saharan Africa, Latin America and the Caribbean which suggest that the productivity of contract farming schemes and the degree to which they are viable and equitable depend as much on non-market (socio-political) factors as on market (economic) factors or on the

interaction between the two (Carney, 1994, Daddieh, 1994, Goldsmith, 1985, Grosh, 1994, Korovkin, 1992, Raynolds 2000, White, 1997). They have demonstrated, citing rice schemes in Africa and Asia, tomato and banana schemes in Latin America and the Caribbean for instance, that contracting is not necessarily commodity specific or technically determined. Alongside technical characteristics and market structure, these writers argue, political and socio-economic factors also determine the evolution, viability, productivity and equitability of contracting. They demonstrate that even where contracting occurs between private firms and growers, the role of the workforce cannot be ignored in examining the determinants of contract viability, productivity and equitability, for typically, the success for these contracting for both growers and agribusiness firms are usually dictated by the productivity of the workforce (the direct producers). The workers are the direct producers under this arrangement, right from preparing land, planting, weeding, fertilizer application et cetera, ensuring that there is some returns for both the grower and the agribusiness firm. It is evident from the arguments of these writers that few contracting schemes in the Third World would have come to fruition or would be viable without the crucial role played by the complexities of actors.

2.1.5 Related literature

Barclay (1977) studying the Mumias sugar scheme, found out that the scheme had occasioned social differentiation dividing the society into three strata. The rich, the middle group, and the poorest, probably the biggest group and the poorest who cannot subsist unless they sell their labour. This was as the result

of the sponsors of the project regarding industrial and financial viability as the pre-eminent concern. There was inadequate attention on how this stratification may affect the society and impact on productivity.

Little and Watts (1994) documents that the Njoro French beans scheme in Kenya was not paying the contracted farmers enough money to meet household subsistence costs without supplementing it with income from other sources.. Their research indicate that in 1985 average annual income per contracted outgrower was US$40. This is not enough to facilitate them to become good employers.

Agrey (1985) studying rural industralization and food shortages in Mumias sugar scheme found that the introduction of contract farming in Mumias as a cash crop venture traded off food growing and as a result exposed the contracted outgrowers' including their workforce to food dependency. Under this state of food insecurity, the workers who have nothing to sell in order to buy food other than their labour are in a crisis for they must sell their labour at whatever price in order to survive in the money economy that contract farming has bequeathed the Mumias scheme.

Hayness (1974) commenting one year after the establishment of the project had achieved all its social, economic and commercial objectives and that Mumias was receiving considerable spin off benefits in the form of better communications and increased commercial opportunities. Hayness research was limited to commercial and economic aims and goals of the scheme without giving attention to socio-economic issues.

Owinyi (1981) furnishes us with a legal treatise that examines the shortcomings of having families evicted to pave way for the establishment of the MSC nucleus estate. The compensation offered was not enough to buy land elsewhere in the immediate outer zone. This was made difficult by farmers who sensing the opportunity to become rich by growing sugarcane created an excessive demand for land, coupled with the process of land transfer made it more difficult for the evicted families to acquire land in the immediate outer zone. Wanjawa (1999) studied the intersectoral linkages of contract farming scheme of Mumias and revealed that the linkages benefit the various sectors of contracted outgrowers' lives like using the techniques imparted to other spheres of life.

Holtham and Hazzlwood re appraised the Mumias scheme, they were critical of the schemes sociological impact but at the same time qualify it as an overwhelming contribution to the country's objectives of employment generation, foreign exchange savings and income generations.

From the above discussions its clear that no attention has been given to socio-economic characteristic of contracted outgrowers workers. Yet many researches on contract farming have been limited, seeking only to investigate the distribution of costs and benefits between agribusiness firms and contracted outgrowers/ (Ayako et al., 1989, Glover & Kusterer, 1990, Senanayake, 1995, Williams & Karen, 1985). These studies have failed to integrate the impact of the contracted outgrower workforce in their analysis of the viability, productivity and equitability of contract farming. Even those that

have attempted to integrate them in their analyses have failed to integrate the analysis of the impact of their socio-economic characteristics on productivity. It is our argument that the socio-economic characteristics of the contracted outgrowers' workers may also impact and/or be acted upon by contract farming, but this omission has been occasioned by the failure of these studies to conceptualize contract farming as a systemic process that is also embedded in socio-economic characteristics and relationships .

This has been a serious omission and is where this study departs from and seeks to improve on past researches. By failing to incorporate the workforce in the analysis of contracting, and also to conceptualize contract farming as part of the world economic system, these studies employ narrow analytical frameworks that fail to capture the full complexity of actors that interact to determine the productivity, viability, and equitability of contract farming schemes. This research addresses this omission by:

i) Developing an analytical framework that conceptualizes contract farming as a systemic metropolis/satellite process in which exploitative links stretching from the centre to the peripheral smallholder farmers and workers, each extracting an economic surplus from one below (Frank, 1966).

ii) Interrogating the hypothesis that the use of family labour reduces productivity.

iii) Using the above concepts in examining the impact of the socio-economic characteristics of workforce in contract farming on productivity in Mumias Sugar Scheme.

The above concepts are discussed in greater detail under the following theory.

2.2 World System Theory

World System Theory is a macro-sociological perspective that seeks to explain the dynamics of the "modern capitalist world economy" as a "total social system". This theory is closely associated with Immanuel Wallerstein, who in 1974 published a seminal paper, *The rise and Future Demise of the World Capitalist System: Concepts for comparative Analysis.* , in which he dealt with the origin of the world system roughly between the years 1450-1640. The significance of this development was the shift from political (and thus military) to economic dominance in the world affairs. In 1976, Wallerstein published *The Modern World System I: Capitalist agriculture and the Origins of the Europeans World Economy in the Sixteen Century.* This is Wallerstein's landmark contribution to sociological and historical thought. This work falls into the fields of historical sociology and economic history, because of its emphasis on development and unequal opportunity across nations (Goldfrank, 2000).

World Systems Theory developed at a time when the dominant approach to understanding development; *modernization theory*, was under attack from many fronts. With World Systems Theory, Wallerstein aimed at achieving a clear conceptual break with theories of "modernization" and thus provide a new theoretical paradigm to guide on investigations of the emergence and development of capitalism, industrialism and nation-states (Stocpol, 1977 p.1075). World Systems Theory is in many ways an adaptation of dependency theory (Chirot and Hall. 1982). Wallerstein draws very heavily from

dependency theory, a neo-Marxist explanation of development process, popular in the developing world and among whose figures are Fernando Henrique Cardoso,Celso Furtado, Andre' Gunder Frank,Samir Amin and Walter Rodney.

Wallerstein has defined a World System as a social system that has boundaries, structures, member groups, rules of legitimization and coherence. Its life is made-up of conflicting forces, which hold it together by tension and tear it apart as each group seeks eternally to remold it to its advantage. It has the characteristics of an organism, in that it has a life-span over which its characteristics change in some respects and remain stable in others. Life within it is largely self-contained, and the dynamics of its development are largely internal" (Op.cit., 2000). It is this World System that Wallerstein calls "World-Economy", Integrated through the market rather than a political centre, in which two or more regions are interdependent with respect to necessities like labour, food, fuel, capital and protection, and two or more polities competing for domination without the emergence of one single centre forever (Ibid, 2000). But the capitalist world economy still remains more stable than a world empire for several reasons. For one thing, it has a broader base, because it encompasses many states. For another, it has a built-in process of stabilization. The separate political entities within the capitalist world economy absorb whatever losses occur, while economic gains are distributed to private hands.

In adopting this theory, this study accepts Wallerstein's first definition of 1974 that a world-system is a "multicultural territorial division of labour in which the production and exchange of basic goods and farm materials as necessary for the everyday life of its inhabitants. This division of labour refers to the forces and relations of production of the world economy as a whole and leads to the existence of two inter-dependent regions: *Core and periphery.* These are geographically and culturally different, one focusing on labour-intensive and the other on capital intensive-production (Goldfrank 2000). Among the most important structures of the world system is a power-hierarchy between core and periphery, in which powerful and wealthy "core" societies dominate and exploit weak and poor peripheral societies. Technology is a central factor in the positioning of a region in the core or periphery.

Advanced industrialized countries are the cores, and the less industrialized are the periphery. Peripheral countries are structurally constrained to experience a kind of development that reproduces their subordinate status (Chase-Dunn and Grimes, 1995). The differential strength of the multiple states within the system is crucial to maintain the system as a whole, because this economic exploitation makes it possible to increase the flow of the surplus from the lower strata, to the higher strata, from the periphery to the core, from majority to the minority (Ritzer 2000, Skocpol, 1977). This is what Wallerstein called unequal exchange, the systematic transfer of surplus from semi proletarian sectors in the periphery to the high technology, industrialized core (Gold frank 2000). This leads to a process of capital accumulation at a global scale, and

necessarily involves the appropriation and transformation of peripheral surplus (Martinez-vela 2001).

In employing this theory, this study accepts Wallerstein's argument that the world-economy is a power game where the powerful owners of capital at different levels and times dominate and exploit the weak. World Systems Theory would depict individuals actors in contract farming as entities in a total system engaged in this power hierarchy; either as owners of capital, technology, land or labour, having multiple goals, different resource and competence endowments, making decisions about their future development and quality of life. By viewing contract farming as part of the world system (world economy) with actors including the conyracted outgrowers workforce as members, this framework not only captures the complexities of actors, structures and relationship that interact to determine the productivity of contract farming but also expands the parameters of the contract farming debates which have been limited by constraints imposed by narrow theoretical approaches.

The hegemonic and imperialist tendencies inherent in the world economy usually disfavour the contracted farmers and their workforce, given their socio-economic characteristics that are reproduced in this world economic system environment. For instance, the international sugar economy is organized and dominated by a few multinational agribusiness firms based in the West. These agribusiness are basically refiners, and in contract with

millers in the south, they get supplied with raw sugar or sugarcane for refining. Given their (agribusiness) endowments in terms of capital, technology and managerial expertise, the Booker Agricultural and Technical Services (BATS) under invitation from the Kenya Government invested in a feasibility study in Mumias, a rural region in Western Kenya, the scheme becoming operational in 1973.

This scheme is run and managed by the BATS through the Mumias Sugar Company (MSC). The company has contracted outgrower farmers to grow sugarcane and supply it for the refining. The contract typical of the inherent world economic system is designed and drawn by the powerful-the agribusiness: stipulating the duties and obligations of the farmer (Wallerstein, 1974). This leads to a skewed contractual arrangement that disfavours the farmer leaving them as mere pawns. This kind of arrangement results in a paradox of higher rates of exploitation and lower rates of accumulation among the contracted outgrowers' in Mumias Scheme.

This in turn creates a differentiated set of production relations, including: Miller-agribusiness, contracted outgrower-miller, Worker-outgrower; which reproduces itself in different forms of coerced labour, for example where outgrowers left with nobody in the world system power arrangement to extract a surplus economic value from other than their workforce, who by default are mere victims of unequal world economic system; and this forms the focus of our current study. This is the logic in employing Wallerstein's position that the

international division of exploitation is defined not by state borders but by the worldwide economic division of labour (Wallerstein, 2000).

CHAPTER THREE: SITE SELECTION AND METHODOLOGY

3.1 Site selection

The study focuses on the Mumias sugar scheme an area defined by longitudes 60-90 and latitudes 30-50N.The schemes comprises of all those farms within the area above whose radius extends 32 Kms away from the Mumias sugar factory into parts of Bungoma, Kakamega and Busia. The area has a rainfall mean of 157.6mm per month with temperatures throughout the year with slight variations ranging from 28-32 degrees Celsius high to 11-13 degrees Celsius low. (appendix iv)

Although no census has been carried out specifically for he sugar scheme, records at the MSC estimate the population at 550,000 with a density of 286 people per square kilometre and approximately 60,000 households (Wanjawa, 1999)

Methodology

3.2.1 Unit of analysis

Babbie (1995) defines a unit of analysis as that which the researcher seeks to understand. The unit can be a school, individual(s), an organization or a household among others. This study has two units of analysis:

Workforce working in contracted outgrowers sugarcane farms.

The MSC contracted outgrowers sugarcane farmers

The rationale behind the selection of two units of analysis was that: First, the farmers were useful in helping the researcher reach the workforce and help the

researcher associate the workforce with productivity. Secondly, the MSC contracted outgrowers farmers were essential in understanding if their socio-economic characteristics determine the characteristics of their workforce.

3.2.2 The Research Design

To cover relevant characteristics of the sampled contracted outgrowers and their workforce involved in contract farming, sampling was guided by stratified and systematic random sampling while data collection used a survey in which questionnaires were major data collection tools. In addition, observation was used to take into account the observable socio-economical status of the workforce. All these were done to aid in understanding the impact of the socio-economic characteristics of the farmers and workers on productivity.

3.2.3 Population and sampling

Singleton et al (1988) defines sampling as the process by which a relatively small number of individuals, objects or events is selected and analysed in order to find out something about the entire population from which it was selected.

Mumias Sugar Scheme is organized such that farmers are from within a radius of 32 kilometers from the factory itself. The scheme consists of over 40,000 contracted farmers who fall in four zones namely: Northern Zone, Southern Zone, Eastern Zone and Western Zone.

Because of zoning, stratified and systematic random sampling methods were used in order to capture the zonal variations, and to ensure that various

characteristics of the population (outgrowers) were represented in the sample. The aim was to obtain a sample that would be manageable given limited resources and time.

Stratified sampling procedure was used to get a total of 120 respondents.18 contracted outgrowers were drawn from the Eastern Zone and 12 contracted outgrowers were drawn from the Northern Zone. The Eastern zone was selected because these farmers have participated the longest from the early 1970s and they have very small plots, a feature shared by the Southern Zone. The Northern Zone was selected because they were the last ones to enter into contract with the Mumias Sugar Company and they have huge tracks of plots just like the Western Zone (Wanjawa; 1999). We selected 3 workers from each of the 30 contracted outgrowers through simple random giving a total of 90 workers.

3.2.4 Data Analysis and Presentation

In this thesis, I used the Statistical Package for Social Sciences (SPSS). SPSS is used in the organization, interpretations and presentation of descriptive and inferential statistics. Descriptive statistics were used to obtain frequencies, percentages and averages. Specifically, chi-square was used to estimate the differences between groups and the extent to which the observations were significant and can be generalized to the population.

The formula for calculating Chi-Square and Contingency Coefficient are presented below.

$$\chi^2 = \sum_{k}^{i} \frac{(O - E)^2}{E}$$

Where χ^2 = Chi-Square

O= the Observed Frequency

E= the expected Outcome

Contingency Coefficient Formula;

$$c = \sqrt{\frac{\chi^2}{n + \chi^2}}$$

Where: C=Contingency Coefficient

χ^2 = Chi-Square

n = The Sample Size

These tools were chosen since many of the variables were nominally measured. Further analysis with the measures of association was adopted to take care of the weaknesses of Chi-Square alone. For instance, Chi-Square does not actually show the extent of relationship between variables. Since all measure of associations are ratios, contingency values were translated into

percentages to clearly show the extent of relations in percent, which is easy to understand and interpret.

The Multiple Regression Model

Multiple regressions were used to identify impact of the various characteristics on productivity and other dependent variables. Multiple regression analysis enables us to make use of many variables at ago in explaining the variation in the study's dependent variable. More important the model helps us to study the linear relationships between a set of independent variables and the dependent variable, while taking into account the relationships among the independent variables. Multiple regression model is therefore adopted for this purpose. The formula is given below:

$$Y = \alpha + B_1X_1 + B_2X_2 + B_3X_3 + ... + E.$$

Y=the dependent variable

α = the Y intercept or the constant

X=the predictor variable

B=is the coefficient of the partial (or net) regression.

CHAPTER FOUR: DATA ANALYSIS

4.1 Introduction

In this section, primary data are summarised and organised using descriptive statistics such as measures of central tendency and percentages. The rationale behind this organisation is to show both Mumias and National trends in production of sugarcane. The data were collected in two purposively selected zones (Eastern and Northern zones) of the Mumias Sugar Cane Scheme in Western Kenya. The discussions under this chapter therefore are based on the secondary data and interviews drawn from these zones. The following Table 4.1.1 reproduces the trend in production of sugarcane in Mumias since 1993 to 2002.

Table 4.1.1: Mumias Sugarcane Yield, 1993-2002

Year	*Yield (tonnes)*	*Growth rate*
1993	1862,625	
1994	2,120,783	1.14
1995	1,815,104	0.86
1996	1,781,178	0.98
1997	1,802,761	1.01
1998	2,122,072	1.18
1999	2,018,560	0.95
2000	1,949,679	0.97
2001	2,039,543	1.05
2002	2,208,170	1.08

Source: Kenya Sugar Board, 2003

The data in Tables 4.1.1 above indicate that production of sugar has been fluctuating, in Mumias Scheme for the last ten years. Except the year 1994 when the scheme recorded 1.14-growth rate, this is probably due to low productivity of the contracted outgrowers' who are the majority producers of sugarcane.

4.1.2 The national trends.

The data below the national production and consumption figures. The last decade experienced a lower growth rate or low productivity at times below the demand, resulting into importation. Indeed, the highest years of deficit were 1986, 1994 and 1998 where 57% and 42% respectively were imported. The problem of productivity compounded by under capacity and inefficiencies might have been the cause.

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Table 4.1.2 represents production/consumption/imports and exports of sugar in Kenya from 1981 to 2002.

Table4.1.2: Production/Consumption, Imports and Exports of Sugar in Kenya: 1981-2002

Year	*Production*	*Consumption*	*Imports*	*Export*	*Imports/ Pro %*
1981	368,970	324,054	Nil	69,054	-
1982	308,019	328,236	Nil	18,2000	-
1983	326,329	332,973	Nil	3,880	-
1984	372,114	348,678	4,000	4,001	1
1985	345,641	373,890	33,000	Nil	10
1986	365,796	381,394	142,500	Nil	39
1987	413,248	400,700	11,500	Nil	3
1988	411,296	462,207	42,000	Nil	10
1989	441,261	489,544	80,000	Nil	18
1990	431,836	537,999	64,050	Nil	15
1991	433,713	493,945	21,288	Nil	5
1992	371,225	552,000	124,463	Nil	34
1993	381,211	560,000	65,217	Nil	17
1994	303,292	560,000	174,049	Nil	57
1995	384,171	569,000	24,440	17,220	6
1996	389,138	570,00	65,816	24,478	17
1997	401,610	580,000	52,372	25,050	13
1998	449,132	587,134	186,576	Nil	42
1999	470,788	609,428	57,701	Nil	12
2000	401,984	631,200	118,011	2,088	29

Source: Kenya Sugar Board, 2003

The following Table 4.1.3 shows the area under cane in Mumias Sugar Scheme from 1980 to 2002

Table4. 1. 3: Area Under Cane in Mumias, 1990-2000

Year	Out growers	Nucleus Estate	Total Area	Out Grower /Total Area %
1990	32,414	3,301	35,715	90.6
1991	32,733	3,286	36,019	90.8
1992	33,676	3,261	36,937	91.2
1993	38,158	3,144	41,302	92.4
1994	38,289	3,320	41,609	92
1995	40,216	3,289	43,505	92.4
1996	39,854	3,403	43,257	92
1997	38,069	3,331	41,400	92
1998	38,626	3,331	41,957	92
1999	37,016	3,247	40,263	92
2000	41,728	3,438	45,166	92.4
2001	44,850	3,340	48,190	93
2002	44,983	3,370	48,353	93

Source: Kenya Sugar Board, 2003

Data in Table 4.1.3 indicate that the area under cane for nucleus estate remain relatively constant. The area under cane for the outgrowers increased considerably from 32,414 in 1990 to 37,016(39%) in 1999. It is concluded therefore that in Mumias scheme, outgrowers constitute major producers of sugarcane.

4.2.0 Characteristics of the Contracted Outgrowers' in Mumias Scheme

In this section, we present the socio-economic and other characteristics of the contracted outgrowers' that have potential to influence productivity and organization of production. The factors include: Sex, age, marital status, family size, educational level, other occupation other than farming, acreage, maturation period, best harvest, other crops, type of labour used, reasons for choice of labour, labour contract, remuneration, tonnage, frequency of visits by extension officer.

4.2.1 Age of the contracted outgrowers'

The age of the outgrowers ranged from 31 to 85 years of age. With a mean of 51 years and the modal age is 35 years. Indeed, as summarised in Table 9 below over 63.3% of the outgrowers are aged over 40. This can be explained by the fact that among the Luhyia ethnic group of Western Kenya, inheritance and ownership of ancestral land is by passing title to the oldest male member of the household. This finding corroborates that of Wangoli (1999) that sugarcane farming is dominated by the elderly because they are the ones with the land title deeds.

Table 4.2.1: Distribution of contracted outgrowers' by Age

Age Category	*Frequency*	*Percentage*
31-40	11	36.7
41-50	5	16.6
51-60	5	16.6
61 +	9	30.1
Total	30	100.0

Source: Field data

4.2.2. Sex of the contracted outgrowers'

In this study, of the total sample of 30 contracted outgrowers, 73.3% were males and 26.7% were females. The higher percentage male contract outgrowers' is an offshoot of dynamics of land ownership in the area where, being a patriarchal society, only male children inherit land. This is consistent with findings of Rakama (1996). Data on the distribution of the outgrowers by sex represented in Table 8 below:

Table 4.2.2: Distribution of contracted outgrowers' by Sex

Females	*Frequency*	*Percentage*
Males	22	73.3
Females	8	26.7
Total	30	100.00

Source: Field data

4.2.3 Family Size of Contracted outgrowers'.

Data were obtained on the family size of the contracted outgrowers and are summarised in Table 12:

Table 4.2.3: Distribution of contracted outgrowers's by their Household Size

Family Size	Frequency	Percentage
Monogamous family with a child	1	3.3
Monogamous family with two children	2	6.8
Monogamous family with three children	1	3.3
Monogamous family with more than three children	13	43.3
Polygamous family with more than 4 children.	13	43.3
Total	30	100.0

Source: Field data

Data on Table 4.2.3 indicate that 43.3% of the contracted outgrowers' were couples with more than three children and a similar percentage (43.3%) were polygynous families with more than four children. Indeed, both large and polygynous families account for 86.6% of the outgrowers and reflect the importance of large families as security and source of cheap labour in traditional societies (Shakeel, 2003).

4.2.4 Education Background of contracted outgrowers'

The distribution of contracted outgrowers by their level of education is presented in Table 10 below:

Table 4.2.4: Distribution of contracted outgrowers by Level of Education

Level of Education	*Frequency*	*Percentage*
None	9	30.0
Non-formal school	2	6.6
Primary school	6	20.0
Secondary school	5	16.7
Post-secondary school	8	26.7
Total	30	100.0

Source: Field data

Data on education show that 30% of the contracted outgrowers had no formal education and most likely farming is the only skill they possess for their livelihood. The data also indicate that 26.6% of the outgrowers have attained post-secondary level of education and this category of the contracted outgrowers may be responsible for promotion of the current spate of awareness for better contract terms.

4.2.5 Alternative Occupations of Contract outgrower

The alternative occupation of contracted outgrowers was obtained in order to examine the way they supplement their sugarcane earning. Table 4.2.5 summarises the distribution of outgrowers by their alternative occupations.

Table 4.2.5: Distribution of contracted outgrower by their Alternative Occupation

Other Occupation	*Frequency*	*Percentage*
Clergy	1	3.3
Teacher	6	20.0
MSC. Employee	5	16.7
Medical staff	2	6.7
Subsistence farmers	7	23.3
Politicians	1	3.3
Petty retailers	8	26.7
Total	30	100.0

Source: Field data

According to the data in Table 4.2.5, 26.7% of the contracted outgrowers' were also micro-entrepreneurs selling paraffin, vegetable vending, beer brewing and cereals to supplement their earning from cane farming. Of the total alternative occupations 23.3% were involved in subsistence farming. This scenario clearly shows that sugarcane farming is not enough to sustain a meaningful life to the contracted outgrowers.

4.2.6 Harvest per Acre (tonnage)

The least tonnage reported is 45 tonnes and the highest is 90.5 tonnes per acre. This variable was employed in the study to shed some light on the yield per acre. Findings from Table 4.2.6 below indicate that the majority contracted outgrowers (76.7%) had yields of 70 tonnes and below per acre. This means that they are under producing according to the agronomical standard of the Mumias Sugar Company, which stands at an average of 120 tonnes per acre (MSC, 1990/91). Probably, this can be attributed to poor crop husbandry.

Table 4.2.6: Distribution of Respondents by Harvest Per Acre

Tonnage Category	*Frequency*	*Percentage*
45-60	8	26.7
61-70	15	50.0
71(+)	7	23.3
Total	30	100.00

Source: Field data

4.2.7 Visits of the Extension Officer

The variable extension officer is used in this study to highlight on the availability and accessibility of extension officers' in accordance with crop husbandry practices. Researchers and policy-makers agree that access to necessary information is crucial to better yields (World Bank, 1992, GoK, 1996). Table 4.2.7 below shows the distribution of contracted outgrowers by frequency of visit of the extension officers. This variable was used to show the

availability and accessibility of agricultural knowledge to contracted outgrowers in a bid to increase productivity.

Table 4.2.7: Frequency of Visits by Extension Officers

Extension Office Visits	*Frequency*	*Percentage*
Twice a month	2	6.7
Thrice a month	28	93.3
Total	30	100.00

Source: Field data

Findings from Table 4.2.7 indicate that majority of the contracted outgrowers' (93.3%) had contact with the extension officers three times a month. This indicates that the contracted outgrowers are exposed to the required agricultural practices and rules out the possibility of ignorance.

4.2.8 contracted outgrowers' Land Under Cane

Below is acreage of land under cane as captured in Table 4.2.8

Table 4.2.8: Distribution of Respondents by Acreage under Cane

Acreage	*Frequency*	*Percentage*
0.01-5.0	21	70
5.1-10	3	10
10.1(+)	6	20
Total	30	100.00

Source: Field data

The above table shows that 70% of the contracted outgrower own 5 acres of cane land and below. This is a reflection of the important role played by the

contracted outgrowers' in contract sugarcane farming in Kenya. The large number of contracted outgrowers' with low acreage under cane can also indicate increasing pressure on land due to population explosion.

Closely linked to the above variable is the food crop. This variable is used to highlight the staple food of the contracted outgrower. Findings of the study show that maize was the leading food crop as revealed by all 100% sampled contracted outgrowers, while beans was the second most important food crop. Importantly, maize is planted to supplement sugarcane earnings because sugarcane is a cash crop. This is in tandem with the company regulations that 20% of the farm should be under food crop (Ibid, 1977). More so, beans are planted because they are easily inter-planted with canes in the first cycle plant (Wangoli, 1999).

4.2.9 Type of Labour used by Contracted outgrower

Data on the type of labour used by contracted outgrowers are presented in Table 4.2.9

Table 4.2.9: Distribution of contracted outgrowerss by the Type of Labour used

Labour Type	*Frequency*	*Percentage*
Hired Labour	15	50
Family Labour	15	50
Total	30	100.

Source: Field data

Data in Table '4.2.9 indicate that 50% of contract outgrowers' use hired labour and a similar percentage (50%) use family labour. This finding concurs with our observation in the field that labour is readily available and cheap.

4.2.10 Workforce Remuneration by Contracted outgrowers'

Data on remuneration of the work force were obtained and summarised in the table below.

Table 4.2.10: Distribution of contracted outgrowers' by Workforce Remuneration

Remuneration (in planting, weeding, etc)	*Frequency*	*Percentage*
Pay	12	40
No pay	18	60
Total	30	100.

Source: Field data

Data in Table 4.2.10 indicate that during planting, weeding, and fertiliser application 60 percent of the contracted outgrowers' do not pay any wages for labour. Probably contracted outgrowers as household heads are appropriating their family members' labour and it could also be true that they pay in kind. The remaining 40% are paid between KShs. 600-1,000, is subject to workers' bargaining power.

Linked to the above variable is the existence of labour contract between the contracted outgrower and the workforce (see appendix IIb). Findings in appendix 3 reveal that 86.7% of contracted outgrowers do not have labour

contracts with their workforce. This is probably due to easily available labour in the Mumias Sugar Scheme as revealed elsewhere in this thesis.

4.2.11 Maturation Period of Cane

The variable maturation period was used to capture the period it takes for canes to be harvested from the contracted outgrower's farms. Interestingly, almost all to the tune of (93.3%) of the contracted outgrowers had 24 months and above as their harvesting period, while only 6.7% recorded 18 months as their harvesting period. The longer period it takes to harvest contracted outgrowers' canes shows how much the contract is violated by the agribusiness firm which is supposed to harvest the farmers' canes at the age of 18 months. Data highlighting this finding are given in Table 4.2.11 below:

Table 4.2.11: Distribution of contracted outgrowers' by Maturation Period

Period	*Frequency*	*Percentage*
18 months	2	6.7
24 months	10	33.3
30 months	16	53.3
More than 30 months	2	6.7
Total	30	100.0

Source: Field data

4.2.12 Best Harvest Cycle

The variable, best harvest cycle, was used in this study to give some indication on which cycle of harvest does the contracted outgrower get more money.

Table 4.2.12 reveals the distribution of the outgrowers by best harvest cycle as shown below:

Table 4.2.12: Distribution of contracted outgrowers by Best Harvest Cycle

Cycle	Frequency	Percentage
Plant	21	70
Ratoon I	7	23.3
Ratoon II	2	6.7
Total	30	100.0

Source: Field data

Findings from Table 4.2.12 clearly show that 70% of the contracted outgrowers register best harvest during the plant cycle of their canes, 23.3% and 6.7% in ratoons II and I respectively. The subsequent fall in harvest registered in the ratoons might be due to frustrations farmers suffer as a result of excess charges or deductions made for credit facilities offered by the miller. Indeed, this leaves the contracted with no motivation to work harder.

4.3 Workforce characteristics

In this section, we examine socio-economic and other characteristics of workers that have an influence on productivity. The socio-economic characteristics of the workers that were obtained include wages, sex, age, marital status, family size, level of education, relationship to the contracted farmer, alternative occupation and land size. These factors were considered because of their potential influence on labour organisation, wages and work conflicts, among other things that eventually determine productivity.

4.3.1 Age of the Workers

Data on the age of workers are summarised in Table 4.3.1 below. In this study, the ages of the workers ranged from 20 to 58 years, an age bracket suitable for manual labour; with a mean of 34.2 years and a mode of 27 years. Indeed, majority of the workers (76.6%) ranged between 20-41 years and reflect the statistical fact that Kenya is composed of a youthful population (see Republic of Kenya 1999, United Nations 1991, 1992, CBS, 2002).

Table 4.3.1: Distribution of Workers by Age

Age Category	*Frequency*	*Percentage*
20-30 Years	43	47.7
31-40Years	26	28.9
41-50 Years	13	14.4
51-58	8	9
Total	90	100.0

Source: Field data

4.3.2 Sex of the Workers

Of the total sample (90 workers), 64.4% were females and 35.6% were males. These data are consistent with the expectation and the contention by Suda (1980) that the majority of workers in rural farms are women. The higher percentage of females in the workforce has been explained in terms of migration by men to urban areas in search of better jobs. Furthermore, contracted husbands might have appropriated their wives labour into their farms as farm-work falls under female females roles (Bulow and Sorrenson; 1990 CBS, 2002).

Data on the distribution of the workforce by sex is presented in Table 4.3.2 below:

Table 4.3.2: Distribution of Workers by Sex

Sex	*Frequency*	*Percentage*
Male	32	35.6
Female	58	64.4
Total	90	100.0

Source: Field data

4.3.3 Workers Marital Status

Data on the distribution of the respondents by their marital status are presented in the Table 4.3.3

Table 4.3.3: Distribution of Workers by Marital Status

Marital status	*Frequency*	*Percentage*
Single	12	13.4
Married	73	81.1
Separated	2	2.2
Widowed	3	3.3
Total	90	100.0

Source: Field data

Data in Table 4.3.3 indicate that majority of the workforce (81.1%) were married and therefore have substantial family roles and obligations. It is also noted that only 13.4% of the workforce are single and they have the choice to engage their labour as opposed to the married who have families to take care of.

4.3.4 Workers' Family Size

Data on the family size of workers are presented in Table 4.3.4:

Table 4.3.4: Distribution of Workers by Family Size

Number of Children	*Frequency*	*Percentage*
None	16	17.8
Less than 3 children	38	42.2
4-6 children	23	25.6
More than 7 children	13	14.4
Total	90	100.0

Source: Field data

The above data on the size of family indicate that majority (42.2%) of the workforce had families of one to three (1-3) children. While such size of the family is modest, these categories of the workforce have considerable domestic obligations. Even more, 40% of the workforce have the size of the family ranging from 4 to more than 7 children perhaps as a buffer to help their parents in assignments.

Data in the field also indicate that this size of family is burdening as shown by the percentage of school-going children per family; 82.2%, 46.7%, 74.4% of the workforce had no child in pre-school, primary or secondary school respectively (see appendix IIc). This scenario probably is because of high expenses involved or these children are substituting their parents in domestic chores.

4.3.5 Relationship of Workers to contracted Outgrower

Data on the relationship of the workers to outgrowers were obtained and used to capture the nature of social organization of labour in the scheme as summarized in Table 4.3.5.

Table 4.3.5: Distribution of Workers by their Relationship to contracted outgrower

Relation	*Frequency*	*Percentage (%)*
Parent/Parent in-law	37	41.1
Brother /sister	5	5.6
Uncle/aunt	18	20
Cousin	18	20.0
No relationship	12	13.3
Total	90	100.0

Source: Field data

Data in Table 4.3.6 indicate that 41.1% of the workers were immediate family members. This observation is consistent with our prediction that majority of the workers among the contracted outgrower'outgrowers would be family members or related to the contracted outgrower in one-way or the other. Indeed, it is not surprising that only 13.3 % of the workers have no relationship to the contracted outgrower.

Linked to these findings is the fact that 83.3% (see appendix IIa) of the workforce comes from Butere-Mumias District. This indicates, probably that employment in Sugarcane farms in Mumias Scheme pays very little to attract people from other far places. Also, it probably depicts that sugarcane farming

is treated as a way of life and hence no serious efforts are made to make it look commercial as to induce migrants.

4.3.6 Education of the Workers

It is important to study the educational achievement of or skills of the workforce so as to facilitate the matching of supply and demand regarding human resources in the labour market (CBS, 2002). Data on education of the workers of the contracted outgrowers are presented in Table 4.3.6and show that 81.2% of the workforce had at least attended primary education. The higher percentage of workforce with primary education or below suggests inability or limitation to secure better employment elsewhere (see CBS, 2002). Data also indicate that workforce with post-secondary level of education were comparatively few at 1.1% because of other better employment opportunities available to this category outside contract farming.

Table 4.3.6: Distribution of Workers by Level of Education

Level of Education	*Frequency*	*Percentage*
None	13	14.4
Primary (1-7 or 1-8)	73	81.2
Secondary	3	3.3
Post-Secondary	1	1.1
Total	90	100.0

Source: Field data

4.3.7 Alternative Occupation of the Workers

Data on alternative occupation were obtained in order to evaluate the way these contracted outgrowers' workers supplement their wages to earn a living. Table 4.3.7shown below reveals the distribution of the workforce by alternative occupations.

Table 4.3.7: Distribution of Workers byAlternative Occupation

Occupation	*Frequency*	*Percentage*
Subsistence farming	38	42.2
Cane-cutting	3	3.3
Micro entreprenuers	29	32.3
Masonry	17	18.9
Others	3	3.3
Total	*90*	*100.0*

Source: Field data

Data in Table 4.3.7 indicate that 42.2% of the workforce was subsistence farmers growing maize, beans, bananas, et cetera to supplement their wages and/or livelihood. Data also indicate that 32.3% were micro-entrepreneurs engaged in selling paraffin, vegetable vending et cetera in a bid to top up their earnings to cater for the family needs (See CBS, 2002).

4.3.8 Wages of the Workers

Table 4.3.8 below shows distribution of workforce by remuneration during planting, weeding and fertiliser application.

Table 4.3.8: Distribution of Workers by Wages

Remuneration	*Frequency*	*Percentage (%)*
Those paid	43	47.8
Those not paid	47	52.2
Total	90	100.0

Source: Field data

The data in table 4.3.8 indicate that during planting, weeding and fertilizer application, over half (52.2%) of the workforce was not paid wages basically because they were family members. And the remaining 47.8% of the workforce were paid wages ranging from Kshs. 250-1, 000, based on the individual bargaining power and the season.

Table 4.3.9: Wages of Workers in Shillings

Total wage/acre					
0	501-1000	1001-1500	150001-20	2000(+)	Total
55%	0.0	00	27%	18%	100%(11)
52%	19%	23%	2%	4%	100%(79)

Source: Field data

Of the 52% that were not given salary, their labour was rewarded in kind as through paying dowry, paying school fees and fending their daily needs. This is consistent with national census (CBS, 2002).

As table 4.3.9 indicates those who earned zero wage (52%) had no labour contract while 55% possessed them. This can be explained by the fact that

majority of these workers are family members. The findings also show that there is a relationship between workforce labour contract and wage earning a fact well-corroborated with the 1999 national census that rural workers lack such benefits like contracts, insurance et cetera.

4.3.9 Land size of the Workers

Data on land size were obtained to ascertain land ownership of the workforce. The size of land one owns may determine the form of one's participation in contract farming.

Data depicting this distribution is shown in Table 4.3.10 below:

Table 4.3.10: Distribution of Workers by Land Size

Size (Acreage)	Frequency	Percentage
Own no land	43	47.8
0.1-2.0 acres	32	35.6
2.1-3.0 acres	12	13.3
3.1 (+)	3	3.3
Total	90	100.0

Source: Field data

The above table shows that nearly half (47.8%) of the workers have no land. This can be explained by the fact that majority of the workforces (64.4%) were women and given the patriarchal tradition of most African societies regarding land ownership, they have no land to their title. 35.6% of the workforce owns less than 2.0 acres of land and which is one of the reasons they sell their labour to make ends meet, making labour readily available in the scheme.

4.4.0 Factors Affecting Workers' Wages.

In this section, we cross-tabulate workers characteristics like possession of labour contract, relationship to the outgrower, females and education that have been hypothesized to have an effect on productivity

4.4.1 Sex of the Workers

The study also examined the way in which the sex of the workers is associated with wage in the contracted outgrowers' employment and the table below presents observations that were obtained.

Table 4.4.1: Relationship between Workers Wages and Sex

	Total wage/acre					
Sex	0	501-1000	1001-1500	15001-2000	2001(+0	Total
Male	72%	9%	3%	3%	3%	100%(32)
Female	41%	21%	29%	7%	2%	100%(58)

$X^2 = 17.165$, df = 4, C= .400, P=0.05

Findings in Table 4.4.1 show that 72% of the male and 41 % of the female workforce fall in no wage category while 3% of the male workers are earning more than Kshs 2000 and only 2% of their female counterparts are in this bracket. The higher number of male workers in no pay category can be explained by the fact that most men would rather work on their own farms and hence no wages.

To know the association between sex of the workers and wage, chi-square is applied; the value of chi-square is 17.2, which is significant at 95% level of significance with 4 degrees of freedom. Furthermore, the study's contingency coefficient values of 0.400 show a moderate relationship between females and wage category. This result confirms that this community treats sugarcane farming as a way of life.

4.4.2 Wages and Workforce Relationship to the contracted outgrower

The study examined the nature of the relationship between the workers and contracted outgrowers, which are summarized in the table 4.4.2.

Table 4.4.2: Wages and Workforce Relationship to the contracted outgrowerr

	Total wage/acre					
Relationship	0	501-1000	1001-1500	15001-2000 2000(+)		Total
Nuclear family member	81%	2%	12%	0	5%	100%(42)
Member wider family	33%	33%	25%	3%	6%	100%(36)
No relations	9%	16%	33%	33%	9%	100%(12)

X^2 47.27, df = 8, C = 0.59, P =0.05

Rakama (1996) and CBS (2002) support the hypothesis that family members are not paid for their services in most households, especially in rural areas. This testifies our findings as shown above. Table 4.4.2 shows that 81% of nuclear family members, 33% of members of the wider family and only 9% of those workers with no relationship to the farmer earned zero wages. The table

also indicates that 33% of workforce from the wider family earned between KShs 500-1000 and 25% of them earned between KShs 1000-1500 while 66%(33+33) of those workers with no relationship with the farmer earned between KShs 1001-2000. In view of this observation, it can be concluded that the workforce of the outgrower is based on family membership. This means that there is an association between relationship of the workers to the outgrower and the wage. Indeed, the study's contingency coefficient value of 0.587 shows a very strong association between workforce relationship to the out growers and wage. These findings imply that those workers who are related to the farmer are more likely not to be remunerated .Chi-square (47.3) is used, which is significant at 95% level of significance with 8 degrees of freedom.

This research finding asserts that workforce related to the outgrower farmer is likely not to be compensated for this being a traditionally agrarian community, agriculture is viewed as a way of life and there is no distinction between this commercial venture and their agrarian way of life. As a result, the corporate ethic is lacking.

4.4.3 Relationship of Workers Wages with their Education.

The study examined further the way in which the education of the workers are associated with the wages and the table below summarizes the observations that were obtained.

Table 4.4.3: Relationship between Workers Wages and Education

Education level	Total wage/acre					TOTAL
	0	501-1000	5001-1500	15001-2000	20000(+)	
No education	31%	15%	39%	15%	0	100%(13)
Primary	55%	16%	18%	4%	7%	100%(73)
Secondary(+)	75%	25%	0	0	0	100%(4)

X^2 = 9.590, df = 12, C = 0.310, P=0.05

Table 4.4.3indicates that 31% of workforce with no level of education, 55% of workforce with primary level of education and 75% of those with secondary and above earned zero wages. While no worker with secondary level of education and above earns more than Kshs. 1000, 7% of those with primary level earn more than Kshs. 2000. This can be explained by the fact that labour in the scheme is abundantly available and therefore education is not a consideration, in addition manual labour is not pegged on education nor does it require education skills.

The chi-square is also utilized to verify the significance of the association; the value of chi-square is 9.6 with 12 degrees of freedom at 95% level of significance, which is insignificant. Also the study's contingency coefficient value is weak at 0.310. This means that there is a weak relationship between wage category and workforce level of education.

This finding affirms that work in the outgrower scheme in not well paying to attract the educated. The scheme managers should strive to step up the wage to lure the educated with their ability to understand the logics of agronomy and this capacity will go a long way in helping raise productivity in the scheme.

4.4.4 Contract

One of the factors that influence terms and conditions of the workers for the outgrower is the work contract. The table below provides cross-tabulations of the contract of the workers and wages.

Table 4.4.4: Workers Wages and their Work Contract

	Total wage/acre					
Contract	0	501-1000	1001-1500	1501-2000	2000(+)	Total
With contract	55%	0.0	00	27%	18%	100%(11)
Without contract	52%	19%	23%	2%	4%	100%(79)

X^2= 18.84, df = 4, C = 0.42, P=0.05

Table 4.4.4 indicates that those who earned zero wage 52% had no labour contract while 55% possessed them. This can be explained by the fact that majority of these workers are family members. The findings also show that there is a relationship between workforce labour contract and wage earning. Chi-square was used to determine this and revealed a value of 18.8, which is significant at 95% level of confidence at four degrees of freedom. In addition, the study's contingency coefficient value of 0.42 shows a moderate relationship between workforce labour contract and wage earning.

The implications from this finding is that workforce with work contract is more likely to compensated than those without. In this respect, it is recommended that the workforce insist on the availability of the work contract. To achieve this, the scheme managers should strive to make it as a matter of policy that all workers should be on contract working in the scheme. And also civic and non-governmental organizations should try to conscientize the workers that its their right to have a contract of work. This is because well-paid workforce will yield better results because of unit of purpose in their duties.

4.5.0 Factors Influencing Workforce Land size

The study also examined joint effects of workers' family size, workers' age, and workers' education on the land size and observations obtained are summarized below. These cross tabulations reveal the position one plays in contract farming.

Table 4.5.1: Relationship between Workers Land Size and Workers Family Size, Age, and Education.

Predictor Variable	B	Beta	*t*	Significance
Workforce family size	0.138	0.298	2.078	0.041
Workforce Age	2.109	0.161	1.156	0.251
Workforce education	5.853	0.21	0.193	0.848

Constant = -0.83, Multiple R= 0.418, R square R2= 0.175, Value of F= 6.080, Significance= 0.001

Data in Table 4.5.1 indicate that family size is the best predictor of land size. The partial regression coefficient shows that one unit increases in family size increases land size by 0.138 units. This explains the casual observation made in the field that majority of the land title deeds are still under the custody of the elderly household heads. This being ancestral land, the title deeds are with the eldest survivor under whose umbrella fall many families.

The second best predictor of land size is the age of the workers. The partial regression coefficient indicates that a unit change in age increases land size by 2.109 units. This means that as one grows older, he/she gets in charge of the ancestral land on behalf of the clan or wider family. Indeed, this finding supports an earlier finding that land ownership in Western Kenya and indeed Africa is a privilege of the old.

Educational level of the workforce is the third best predictor of land size. The partial regression coefficient shows that a unit increase in education increases land size by 5.853 units. This means that as a person gets more educated, he/she gets liberated from the traditional fixation of social rank and privilege of waiting to inherit land. He/she buys land independently from his traditional heredity stream.

Finally, the study reports a value of R squared (R^2) as 0.175 for the regression model. The F value of 6.080 depicts that the model is significant at the study's

95% confidence level. Hence, we reject the null hypothesis of no relationship between family size, age and education level of workforce and their land size.

4.6.0 Factors Influencing Cane Farm Acreage

4.6.1 Contracred Outgrowers

The study examined the effects of the age of farmers, education of contracted outgrower, family size of the contracted outgrower and extension services on acreage under cane, and the observations obtained are summarized Table 4.6.1.

Table 4.6.1: Relationship between Cane Farm Acreage and Extension Officer Services, contracted outgrower Education, Age, and Family Size

Predictor variables	B	Beta	t	Significance
Farmers' age	5.8	0.3	2.6	0.01
Farmers' education	-0.4	-0.2	1.4	0.2
Farmers' family/Size	-0.3	-0.1	1.2	0.2
Extension officers	0.3	0.1	0.7	0.5

Constant = 0.39, Multiple R = 0. 49,R squared R^2= 0.24, (F) Value= 3.606, Significance= 0.002.

In Table 4.6.1, the Beta weights show that farmers' age is the best predictor of cane farm acreage. The partial regression coefficient shows that one unit increase in contracted outgrowers' age increases farm acreage by 5.763 units. This corroborates the earlier observation that it's the elderly who owns land in the scheme.

Contracted outgrowers' educational level is the second best predictor of farm acreage. The partial regression coefficient indicates that a unit increase in farmer's education decreases farm acreage by 0.360 units. This means that as one gets more educated, he/she gets a better understanding of the dysfunction of the contract farming and starts withdrawing his/her participation.

From the Beta weights shown in the table above, contracted outgrowers' family size is the next predictor of farm acreage. The partial regression coefficient indicates that unit increases in the farmer's family size decreases the farm acreage by 0.304 units. This means that, as the farmer's family gets bigger; the need to subdivide arises thus reducing the size of the original parcel.

Extension officer services are the fourth best predictor of the farm acreage. The partial regression coefficient shows that one unit increase in extension officer services increases the farm acreage by 0.325 units. This occurs because of the fact that now farming becomes easier with more knowledge.

R squared (R^2) for the study is 0.235. The F value is 3.606, which is significant at 0.002 far above the study's 0.05-confidence level. Hence, we reject the null hypothesis of no relationship between these factors and farm acreage.

4.6.2 Workforce

The study examines further the effects of the age of workers, education of the workers, and family size of the workers on acreage under cane, and the observations obtained are summarized in Table 4.6.2.

Table 4.6.2: Relationship between Cane Farm Acreage with Workers' Age, Education and Family Size.

Predictor variables	B	Beta	t	Significance
Workers age	4.1	0.2	1.1	0.3
Workers education	0.5	0.1	0.9	0.5
Workers F/Size	-2.3	-0.03	-0.2	0.9

Constant = 0.39, Multiple R = 0. 49,R squared R^2 = 0.235, (F) Value= 3.606, Significance= 0.002.

Workers' age is the best predictor of farm acreage. The partial regression coefficient indicates that one unit increase in workers age increases farm acreage by 4.070 units. This can be explained by the fact that if one has elderly workers' he/she is likely to be sure of their availability, accessibility and experience, and as such maintains or increases his/her big farm.

The next predictor of farm acreage is worker's education. The partial regression of workers education increases farm acreage by 0.537. This change can be attributed to the earlier observation that education is of no significant importance in outgrower's farm workers productivity.

The last predictor of farm acreage is the workforce family size. The partial regression coefficients indicate that one unit increase in workforce family size reduces farm acreage by 2.256 units. This can be explained by the fact that a worker with a large family will claim more pay or else work simultaneously on many assignments to feed his/her family, this will reduce farm productivity and force the farmer to reduce it to manageable levels.

R squared (R^2) for the study is 0.235. The F value is 3.606, which is significant at 0.002 far above the study's 0.05-confidence level. Hence, we reject the null hypothesis of no relationship between these factors and farm acreage.

Factors that Influence Production

4.7.1 Contracted outgrowerss'

One of the hypotheses of the study was that socio-economic characteristics of the contracted outgrower influence the characteristic of his/her worker, which will in turn affect productivity. Therefore, in this section, we set out to test this hypothesis as shown in the tables below:

Table 4.7.1: Relationship between Farm Production with Acreage, contracted outgrowers'Education, Age, and Family Size.

Predictor variable	B	Beta	T	Significance
Farmer education level	-4.6	-0.6	4.3	0.0
Age of farmer	-0.2	-0.3	2.2	0.03
Farmers f/size	-1.4	-0.1	1.4	0.2
Acreage under cane	0.1	0.03	0.3	0.8

Constant = 87.818, Multiple R = 0.524, Rsquared (R2) = 0.274,F value = 4.423, Significance = 0.000.

Contracted outgrowers educational level is the best predictor of farm production. The partial coefficient regression reveals that one unit increase in education reduces production by 4.57units. This can be explained by the fact that level of education enables one to understand and comprehend the many reasons why they are not breaking even, that they are just hired hands on their own farms. This discourages them, they get disillusioned and consequently production goes down.

The age of the contracted outgrower is the best second predictor of farm production. Partial regression coefficient depicts that one unit increase of contracted outgrowers' age reduces productivity by 0.200 units. This can probably be explained by the fact that as the principal farmer grows old, old age compromises his/her ability to supervise the correct husbandry practices on his farm, leading to reduction in production.

Family size of the contracted outgrowers' is the third best predictor of the farm production. Partial regression coefficients indicate that one unit increase in contracted outgrowers' family size reduces farm production by 1.42 units. This can well be explained by the fact that as one's family size increases, he/she has little resources left after fending his/her family to cater for better care to the cane crop, the result is low productivity.

The fourth best predictor of farm production is contracted outgrowers' acreage under cane. The partial regression coefficient shows that one unit increase in the contracted outgrowers'acreage under cane increases farm production by 0.12. This can be explained by the fact that as the investment becomes bigger, the investor is keen in its operations and as a result production is bound to increase.

The study's R squared (R) is 0.274 and the F value is 4.423, which is significant at 0.000 level of confidence far above the study's 0.00 level of significance. Hence, we reject the null hypothesis of no relationship between these factors and farm production.

4.7.2 Workforce characteristics

Table 4.7.2: Relationship between Farm Production with Workers' Age, Education and Family Size.

Predictor variable	B	Beta	t	Significance
Workers age	0.2	0.2	1.2	0.2
Worker's education	3.0	0.1	1.3	0.2
Worker f/size	-0.5	-0.1	-0.9	0.4

Constant = 87.818, Multiple R = 0.524, R squared (R2) = 0.274,F value = 4.423, Significance = 0.000

From the multiple regression tables above, the Beta weights show that workers' age is the best predictor of farm production. The partial regression coefficient shows that one unit increase in workers' age increases farm production by 0.17 units. This is explained by the fact that farming skills develop through hands-on experience and with increase in age these skills are sharpened. And these categories of workers tend to care better for the cane crop and as such better yields.

The second best predictor of farm production is workers' education. The partial regression coefficients indicate that a unit increases in workers' education increases farm production by 2.99. This is because as one gets to higher levels of education, he/she gets to grasp some of the agronomical logics such as applying the right quantities of fertilizers among others, which aid in increasing production of the farm.

Workforce family size is the third best predictor of farm production. Partial regression coefficients show that one unit increase in workforce family size reduces farm production by 0.462 units. This is because he/she gets more commitment in a bid to satisfy his family size and as such, some of his/her assignments suffer lack of sufficient attention resulting in reduction of production.

The study's R squared is 0.274 and F. value is 4.423, which is significant at the study's 95% level of confidence. Hence, we reject the null hypothesis of no relationship between these characteristics and farm productivity.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter consists of conclusions, implications and recommendations based on the study/findings. More significantly the chapter summarizes the extent to which the study's objectives have been met and is important in giving the answers to the questions asked in chapter one and two of this thesis as well as the results of the hypotheses tested.

This study was designed to explore the role and impact of the socio-economic characteristics of the workforce and contracted outgrowers in the productivity of sugarcane in the Mumias outgrowers scheme. It set out to examine the following socio-economic characteristics: Sex, education, age, family size, marital status, land size, level of compensation, relationship to the farmer, availability of contract, et cetera The following are the conclusions and recommendations as deduced from chapter four.

The results of the study as reflected in research findings in the previous chapter, indicate that sugarcane yield in Mumias scheme has increased gradually with large fluctuations. Indeed, the findings also indicate that this increase was almost proportional to increase in area under sugarcane. The conclusion is that the increase in production is not as a result of increasing productivity from the farms but as a result of increased acreage.

The study predicted that the characteristics of the farmer influence the socio-economic characteristics of the worker both of which will influence the levels

of production. The findings of the study showed that farmers' characteristics notably education and age are the best predictors of production in the schemes as reflected in table 4.33. More important to the study was the impact of the characteristics of the worker on production. It was revealed that workers' age and education are the best predictors of production as reflected in table 4.34.

The study also sought to know the conditions of land ownership. It was revealed in table 4.30 that family size and age of the worker are the best predictors of land size. Indeed, this conclusion is typical of most African societies where land ownership is a privilege of the elderly heads of large families. The study also found that farmers' education and age are the best predictors of cane farm acreage. Those who are old are likely to own big cane farms as well as those who are educated.

5.2 Recommendations

Following the above findings, this study made the following recommendations:

Education: That the scheme managers should invest in the education of both farmers and their workers'. From the results of this study we have seen that the future of this scheme lies in an educated workforce. Because these are the people who are be able to keep pace with new technologies and their implications, like the imperatives of using the different types of fertilizers. Consequently, as a matter of policy, those found taking advantage of the low

level of workers' education to collude in buying fertilizer intended for cane husbandry should be given punitive sentences to discourage the act.

Contract: The availability of the work contract was found to be important when it comes to the conditions of the worker on the farm .It is therefore prudent to make it mandatory for farmers to have work contract with their workers, for it will go a long way in securing the rights.

5.3 Areas for Further Research

The whole issue of basic human rights as envisaged through the concept of ethical trade needs great scholarly attention in the sugar industry in Kenya. An attempt should be made to investigate this subject and consequent appropriate recommendations made to give our sugar the ethical trademark.

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APPENDICES

Appendix I: Trends of Sugar Production

Table 4.1: Production/consumption, imports and exports of sugar in Kenya; 1981-2002

Year	*Production*	*Consumption*	*Imports*	*Export*	*Imports/Pro %*
1981	368,970	324,054	Nil	69,054	-
1982	308,019	328,236	Nil	18,2000	-
1983	326,329	332,973	Nil	3,880	-
1984	372,114	348,678	4,000	4,001	1
1985	345,641	373,890	33,000	Nil	10
1986	365,796	381,394	142,500	Nil	39
1987	413,248	400,700	11,500	Nil	3
1988	411,296	462,207	42,000	Nil	10
1989	441,261	489,544	80,000	Nil	18
1990	431,836	537,999	64,050	Nil	15
1991	433,713	493,945	21,288	Nil	5
1992	371,225	552,000	124,463	Nil	34
1993	381,211	560,000	65,217	Nil	17
1994	303,292	560,000	174,049	Nil	57
1995	384,171	569,000	24,440	17,220	6
1996	389,138	570,00	65,816	24,478	17
1997	401,610	580,000	52,372	25,050	13
1998	449,132	587,134	186,576	Nil	42
1999	470,788	609,428	57,701	Nil	12
2000	401,984	631,200	118,011	2,088	29

Source: *Kenya Sugar Board, 2003*

Appendix IIa: Distribution of Workforce by their Original Homes

HOME (ORIGINAL)	FREQUENCY	PERCENTAGE
Butere-Mumias	75	83.4
Kakamega	6	6.7
Busia	3	3.3
Bungoma	4	4.4
Siaya	1	1.1
Outside the Country	1	1.1
Total	**90**	**100.00**

Source: Field data

Appendix IIb: Contracted outgrowers' problems with MSC.

Problems	Frequency	Percentage
Poor pay	17	56.6
Delayed payments	3	10
Delayed fertilizer supply	2	6.7
Delayed harvesting	3	10
Exorbitant charges	2	6.7
High cost of transport	2	6.7
Unfair contractual terms	1	3.3

Source: Field Data

Appendix IIb: Distribution of Contracted outgrowers' By Labour Contract

CONTRACT AVAILABLE	FREQUENCY	PERCENTAGE
Yes	4	13.3
No	26	86.7
Total	**30**	**100.00**

Source: Field data

Appendix IIc: Distribution of workers by children in school.

Pre-primary

	Frequency	Percentage %
0	74	82.2
1	13	14.4
2	3	3.3
Total	90	100.0

Primary

	Frequency	Percentage%
O	42	46.7
1	21	23.3
2	12	13.3
3	13	14.4
4	1	1.1
6	1	1.1
TOTAL	90	100.0

Secondary

	FREQUENCY	PERCENTAGE%
0	67	74.4
1	10	11.1
2	6	6.7
3	7	7.8
TOTAL	90	100.0

Source Field Data

Appendix IIIa: Contracted Outgrowers' Questionnaire

Date: _____

1) Respondent No. _____

2) Contract No. _____

3) Zone _____

4) Location _____

5) Sex Male ☐ Female ☐

6) Date of Birth _____

Educational Levels

- Non-formal education ☐
- Below primary school ☐
- Primary ☐
- Secondary ☐
- Post-secondary ☐

Occupation besides sugarcane farming_____

Your marital status

- Single ☐
- Married ☐
- Separated ☐
- Divorced ☐
- Widowed ☐

What is the size of your family?

- a couple ☐
- a couple with one child ☐
- a couple with two children ☐
- a couple with three children. ☐
- a couple with more than three children ☐
- Household head with more than two wives. ☐

What is the acreage of your farm?. _____(acres)

How much of your farm is under cane?. _____ (acres)

What is the typical period of your harvest?

14 months ☐

18 months ☐

24 months ☐

30 months ☐

More than 30 months ☐

In last harvest what was your production?

Plant _____

Ratoon1 _____

Ratoon 2

_____

What is the main crop in the remaining part of the farm?.

_____

Who works on your sugarcane farm?

Outside hired employees ☐

Family members ☐

Reciprocal labour ☐

Why do you prefer your above choice?_____

Do you provide employment contract to your employees?

Yes ☐ No ☐

How much do you pay your employees per acre?

Weeding (Kshs/acre) _____

Planting (Kshs/acre) _____

Fertilizer application (Kshs/acre) etc._____

What do you consider to be three (3) major problems in your contract with Mumias Sugar Company?

_____

_____

_____

What do you suggest to improve your contract with Mumias Sugar Company?

_____

_____

_____

(a) Have you been involved in any labour dispute in the last 5 years?

Yes ☐ No ☐

(b) Has the frequency of labour disputes in the last 5 years

Increased? ☐

Declined? ☐

Remained the same? ☐

Non-existence? ☐

What do you suggest to improve labour relations with your workforce

_____

_____

_____

_____

What was your yield last harvest in terms of tonnage?_____

Were you satisfied with the harvest?

Yes ☐ No ☐

If NO, why?

_____

_____

How many times did you have the extension services?

Twice a month ☐

Thrice a month ☐

Appendix IIIb:Contracted outgrowers' Workforce Questionnaire

Date _____

Respondent no.

_____

Zone _____

Location

_____

Sex Male ☐ Female ☐

Date of Birth _____

Higher level of education achieved:

i) Below primary ☐
ii) Primary ☐
iii) Secondary ☐
iv) Post-secondary ☐
v) Non-formal education ☐

What is your marital status?

i) Single ☐
ii) Married ☐
iii) Separated ☐
iv) Widowed ☐
v) Divorced ☐

Which other occupation do you have beside employment in this farm?

_____

How many children do you have? _____

What is the age of your children?

1st _____

2nd- _____

3rd _____

Last-born

_____

How many of your children are in

Preparatory?._____

_

Primary_?._____

_

Secondary?._____

_

Colleges/university? _____

What is your relationship with farm owner(your employer)?

Parent ☐

Brother/sister ☐

Uncle ☐

Aunt ☐

None ☐

Do you have a contract with your employer?

Yes ☐ No ☐

How much are you paid per acre during:

i) Planting? Kshs

_____

ii) Weeding? Kshs

_____

iii) Fertilizer application? Kshs.

_____

Which is your original home:

District?

_____

Division?

_____

Do you have your own farm?

Yes ☐ No ☐

What is the acreage of your farm? _____

(a) What do you consider to be three (3) major problems facing your employment in this farm?

i) _____

ii) _____

iii) _____

(b) What are your coping strategies?

_____

_____

_____

_____

What should be done to improve your employment in this farm?

i) _____

ii) _____