

**AN ASSESSMENT OF THE FACTORS
AFFECTING CONTRACT FARMING:
THE CASE OF SUGARCANE PRODUCTION
IN MIGORI COUNTY, KENYA**

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DECLARATION

I, PATRICE LUMUMBA KOKEYO, DO HERE DECLARE THAT THIS Thesis is my original work and has not been submitted for a Degree in any other University.

Signature..... Date.....

This thesis has been submitted for examination with our approval as University Supervisors

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DEDICATION

This research is dedicated to my late mother (Naomi); my father (Joshua); my children (Fred, Juliet, Mudge, and Lynne); and my spouse (Monica Lumumba).

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ACRONYMS

COMESA	Common Market for Eastern and Southern Africa
FAO	Food and Agriculture Organization
FGDs	Focus Group Discussions
GOK	Government of Kenya
HCDA	Horticultural Crops Development Authority
IAD	Institutional Analyses and Development
IDS	Institute of Development Studies
ILRI	International Livestock Research Institute.
KESGA	Kenya Sugarcane Growers Association
KESMA	Kenya Sugar Millers Association
KESREF	Kenya Sugar Research Foundation
KIPPRA	The Kenya Institute for Public Policy Research and Analyses
KISs	Key Informant Surveys
KSB	Kenya Sugar Board
LSD	Least Significant Difference
MASIP	Malawi Agricultural Sector Investment Program
NEMA	National Environmental Management Authority
NEPAD	The New Partnership for Africa's Development
NIE	New Institutional Economics
NTEX	Non-traditional exports
ODI	Overseas Development Institute
OIs	Out grower Institutions
PRSP	Poverty Reduction Strategy Paper

SAT	Sugar Arbitration Tribunal
SONY	South Nyanza Sugar Company
SPSS	Statistical Package for the Social Sciences
SPC	Sugar Parliamentary Committee
TCE	Transaction Costs Economics
TCH	Ton cane per hectare
UNDP	United Nations Development Program

ABSTRACT

This study is an empirical analysis of the factors that influence participation in a contract farming scheme and the impact of contract participation on sugarcane farm households. The study characterizes the nature of the contract scheme. Through a probit model and participatory methodologies the study identifies the factors that influence participation in the contract farming scheme and analyses the impact of participation on farm household welfare. The study relies on cross-sectional data from 115 contract and 69 noncontract sugarcane growers collected through a household survey, from 30 farmers through focus group discussions and key informant surveys.

The study shows that the contracted sugarcane growers were not necessarily better-off than non-contracted farmers from welfare perspective. The contracted sugarcane farmers were experiencing a number of problems including higher cost of administering the contract, than those for the non-contract growers. The study also found that the non-contract growers had more land under food crops than contract farmers whose land was mainly contracted for sugarcane growing. Hence the non-contract farmers appeared more food secure. The study concludes that the main factors influencing farmer participation in sugarcane contracts are:- (i) farm distance to the company sector office (ii) ownership of assets and access to external farm support (iii) risk-averseness (iv) farm household size, and (vi) education of the household head. The contracted farmers also claimed that they experienced high levels of sugarcane post-harvest losses because weighing of their produce was being done at the sugarcane company factory reception area rather than at the farm gate. The study thus recommends the following: (i) reviewing of contract terms and conditions with the objective of reducing contract administration costs; (ii) incorporating soil sampling and testing costs in the production credit extended to farmers; (iii) providing periodic sugarcane technical training to farmers; (iv) weighing of the sugarcane at the farm gate; and (v) payment of sugarcane delivery based on quality (sucrose content).

This study also recommends that the contracted farmers be encouraged to allocate part of their land to production of food crops to enhance food security.

CHAPTER ONE INTRODUCTION

1.1 Background

According to Bijman (2008), contract farming in agriculture between agro food processing industries and producers has become an important phenomenon worldwide, especially for perishable commodities. The rise of contract farming has been due to the need to strengthen vertical coordination between producers and agribusiness firms. The continuous increase in the importance of contract farming has largely been due to the changing global environment, where competition, consumer demands, technology, government policies and agricultural systems have been taking the centre stage.

For a long time in many sub-Saharan African countries, there has been no tradition of written farming contracts. Instead, traditional informal agreements were commonly used and are still respected (Fafchamps, 2004). Application of formal contract farming has now become an option for many African countries as a method of enhancing commercial farming. African smallholder agriculture is characterized by many problems, such as low productivity, natural resource degradation and inadequate basic services for farming. Although contract farming has proved successful in many African countries by enhancing existing income levels, it may not necessarily be a solution for many market failures in agriculture (Warning and Hoo, 2000).

In Kenya, both marketing and production contracts as a form of vertical integration are found in livestock and crop production. Livestock contracts can be found in the pig, egg and broiler markets. In crop production, contract farming is common in the horticultural sub-sector and also in the field crops sub-sector, such as for sugarcane, tobacco, tea, and cotton production. More than 230,000 households in Kenya were involved in the contract production of tea, sugar, oilseeds, tobacco and horticultural commodities by mid- 1980s (Kuntoro and Yoshiharu, 2003). It is estimated that by mid-2000s, 1.2 million out of 3 to 4 million farming households in Kenya were contract farmers in the coffee, tea, dairy cattle, barley (for brewing), vegetable, sugar and corn sectors (Peltzer, 2006).

Generally, the sugarcane sub-sector contributes tremendously to the Kenyan economy through employment creation. It is also an important source of income and livelihood for many smallholder farmers in Kenya. Sugarcane farming, for a long time, has been a dominant feature in the socio-economic lives of over 4 million Kenyans in the South Western part of Kenya (SONY Sugar Company, 2009). Indeed, if the schemes worked efficiently, the farmers would be cushioned against risks and uncertainties related to variations in yield, price fluctuation and unreliable markets. However, the sugar and sugarcane contract schemes have faced increasing production and marketing constraints that seem to be raising the cost of sugar production in Kenya compared to other neighbours like Sudan and COMESA countries (Kegode, 2005). This raises concern on sustainability of sugarcane contract schemes in Kenya in their current form.

Contract farming is particularly important in sugarcane production in Kenya. The growers are subjected to contractual arrangements that specify the sugarcane area to be cultivated and the growing conditions. The farmers are under obligation to deliver the sugarcane to the miller when the cane is mature. The miller, on the other hand, provides all the inputs (land preparation, fertilizers, and chemicals) and any other required expansion loans which are deducted from the sugarcane proceeds. The miller provides an assurance that it will procure all the sugarcane from contracted out-growers. The miller also determines when to harvest, but subcontracts harvesting and transportation to independent companies. However, there is a tendency for the farmers to try and sell their cane to other millers when the crop is ready for harvesting.

Sugarcane contracts are attractive in the sugar industry because of the investment, production and other attributes (asset specificity) which require specific arrangements to facilitate production. Asset specificity refers to investments specifically made for a particular enterprise and whose value is substantially lower outside the particular relationship (Bijman, 2008). In the sugar industry, asset specificity arises because of the milling plants that process the sugarcane and the transport facilities which have limited alternative uses.

Furthermore, due to the techno-economic characteristics of the sugar supply chain, specific contract arrangements between the growers and the processing firms to ensure efficient coordination from planting to harvesting and subsequent delivery of the sugarcane to the factory are important. This is necessary because of the relatively high perishability nature of the crop.

In Migori County of Kenya, sugarcane is mainly grown under contract between farmers and South Nyanza (SONY) Sugar Company. SONY Sugar Company was incorporated by the Kenyan Government in 1976 and commissioned in 1979 with the objective of generating economic, social and financial gains for the local community and the country through the manufacture of mill white sugar for local consumption (SONY Sugar Company, 2009).

To maintain a continuous supply of raw material (sugarcane) of good quality, the SONY Sugar Company has established its own nucleus estate. However, the nucleus estate is unable to satisfy the factory sugarcane requirements. Therefore, the factory expects to supplement its cane requirements through contracted out-grower farmer schemes. This is the arrangement that is referred to as contract farming.

1.2 The sugar industry in Kenya

The development of the sugar industry in Kenya is said to be linked to the history of Asian agricultural settlement in the country. The Asians (then referred to as “coolies”) came to build the Kenya–Uganda railway line at the invitation of the British government, but later began to engage in retail trade and commercial agriculture (Wanyande, 2001). The most successful Asian agricultural settlement was at Kibos, Nyanza Province. They started the first sugar production scheme in 1922 on a commercial basis by establishing Miwani Sugar Mills (Kegode, 2005). The second Asian sugar mill was established in 1927 by Associated Sugar Company Limited at Ramisi in Coast Province and was managed by the Madhvani Group International of India. Before Kenya secured political independence in 1963, the two mills were managed and owned exclusively by private Asian companies up to the mid-1960s. In an effort to achieve self-sufficiency in sugar production, the Government of Kenya has since 1963

continued to expand sugar production through investment in sugarcane growing schemes and factories (see Figure 1.1). Thus, the Government established Muhoroni Sugar Factory in 1966, Chemelil in 1968, Mumias in 1973, Nzoia in 1978 and SONY in 1979 (Kegode, 2005). Currently, there are a number of proposed investments in the sugar sector which include the Tana River Sugar Company, Kamkuywa Sugar Mill, and Butali (Busia) Sugar Mill.

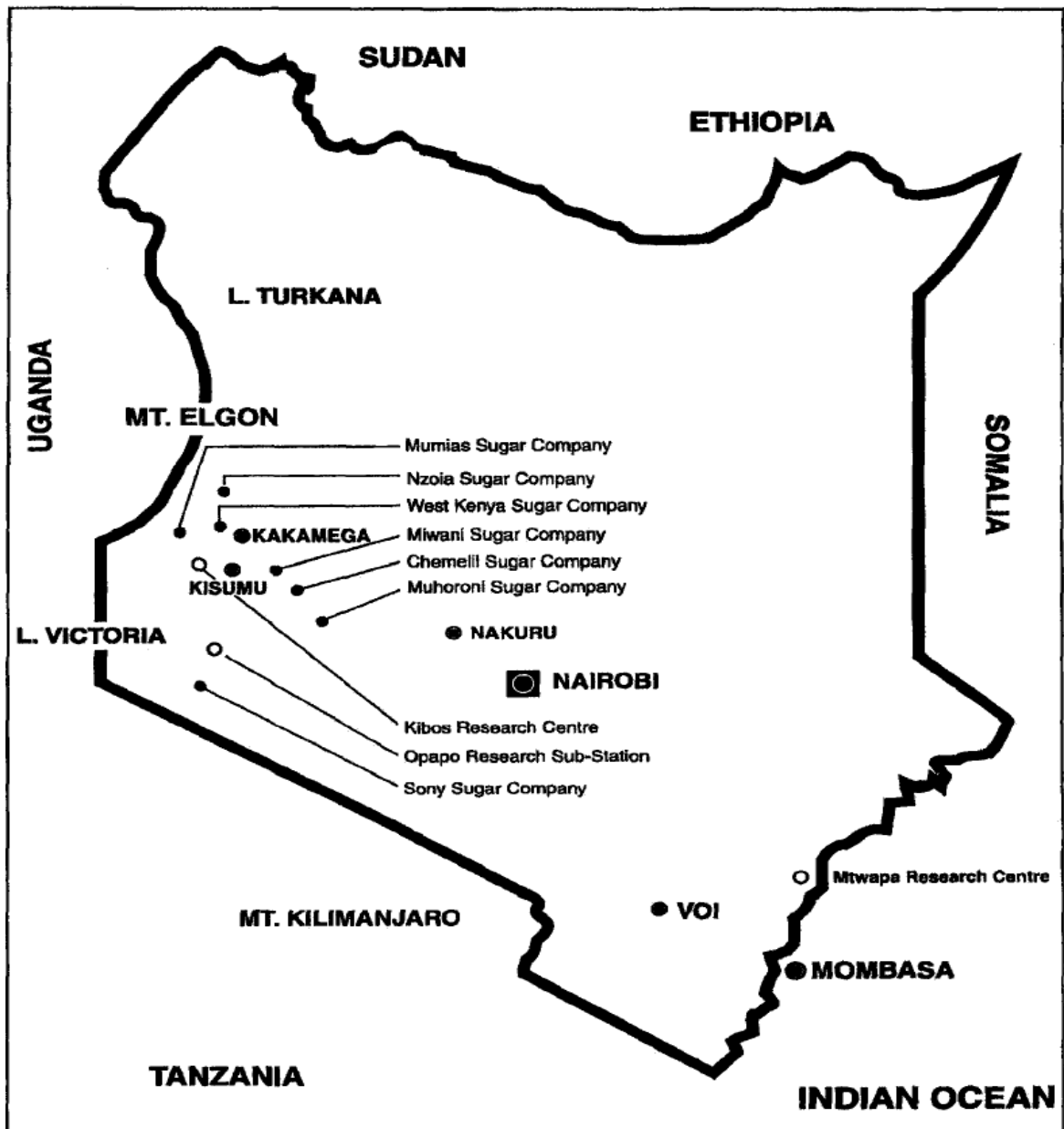
By mid 1990s, the Government started liberalizing trade, thus exposing the local producers to competition from sugar imports. Kenyan sugar is uncompetitive in the world market because the country is a high cost producer, even relative to other African countries. For example, Sudan, Egypt, Swaziland, Zambia, Malawi, Uganda and Tanzania are low cost producers (producing sugar at between US \$ 180-340 per ton, compared to Kenya's figure at US \$ 415-500 per ton) as shown in Table 1.1. Thus, liberalization process over the last one and a half decades has exposed the sugar sub-sector to a major threat with regard to its survival without any safeguard measures.

Table 1.1. Comparative cost of sugar production in COMESA and selected East African countries

Country	Cost USD/ton	Ksh/ton	Exch. Rate [27.4.2013]
Kenya	415-500	34,735.50-41,850.00	1USD = 83.70
Sudan	250-340	20,925.00-28458.00	1USD = 83.70
Egypt	250-300	20,925.00-25,110.00	1USD = 83.70
Swaziland	250-300	20,925.00-25,110.00	1USD = 83.70
Zambia	230-260	19,251.00-21,762.00	1USD = 83.70
Malawi	200-230	16,740.00-19,251.00	1USD = 83.70
Tanzania	180-190	15,066.00-15,903.00	1USD = 83.70
Uganda	140-180	11,718.00-15,066.00	1USD = 83.70

Source: (Kenya Sugar Board, 2009)

Figure 1.1 The location of sugar companies and research stations in Kenya



Source: (European Commission , 2007)

Figure 1.1 shows the location of sugar companies and research stations in Kenya, while Table 1.1 shows the comparative cost of sugar production in COMESA and selected East African countries.

Table 1.1 shows that Kenya is under the category of high cost producers, thus making them very attractive destinations for global sugar exports. The neighbouring countries like Tanzania and Uganda do import sugar that finds its way into Kenya through informal cross border trade, thus posing unfair

competition to the local producers (Kenya Sugar Board, 2009). Furthermore, sugar transshipment from the world market, including COMESA and SADC countries such as Malawi, Zambia and Swaziland, which are low cost producers, poses a major threat to the survival of the Kenyan sugar sub-sector. There have been some periods when due to sugar imports, the domestic sugar prices have been lower than the production costs, thus forcing factories to accumulate unsold sugar stocks, rather than dispose them at a loss (Tyler, 2007).

The zero tariff tax regime operated by the COMESA that allows free movement of sugar by member states does not make it any better for Kenya as a country. However, Kenya is enjoying a temporary reprieve through a COMESA safeguard measure that has been granted to allow Kenya build its competitive advantage until 2014 when it will be lifted. To restructure the sugar sub-sector by February 2014 when the COMESA safeguard expires and for the industry to reposition itself competitively, concerted efforts have been made through the key oversight institutions in the sugar industry in Kenya, such as the Kenya Sugar Board (KSB), the Kenya Sugar Research Foundation (KESREF), the Sugar Parliamentary Committee (SPC), the Kenya Sugar Millers Association (KESMA), the Sugar Arbitration Tribunal (SAT) and the Out-grower Institutions (OIs). However, the outcome has not been very encouraging so far.

1.3 The Problem Statement

South Nyanza (SONY) Sugar Company as an agribusiness firm initiated a sugarcane contract farming scheme (with out-grower farmers' scheme) in Migori District in 1976. The objective was to improve the livelihood of smallholder farmers in the greater Migori District (GOK Report, 2009). SONY Sugar Company is the second largest public sugar producing company in Kenya, supplying 15% of all the sugar in the country. The company is only second to Mumias Sugar Company that supplies 53% of all the sugar produced in the country. However, there is a concern that participation by smallholder sugarcane farmers in the SONY Sugar Company contract scheme has been declining, while the non-contract farming has been on the rise over the last ten years prior to the study. The company has therefore experienced production shortfalls, with sugarcane delivery to the factory by contracted farmers declining from 603,646 tonnes of

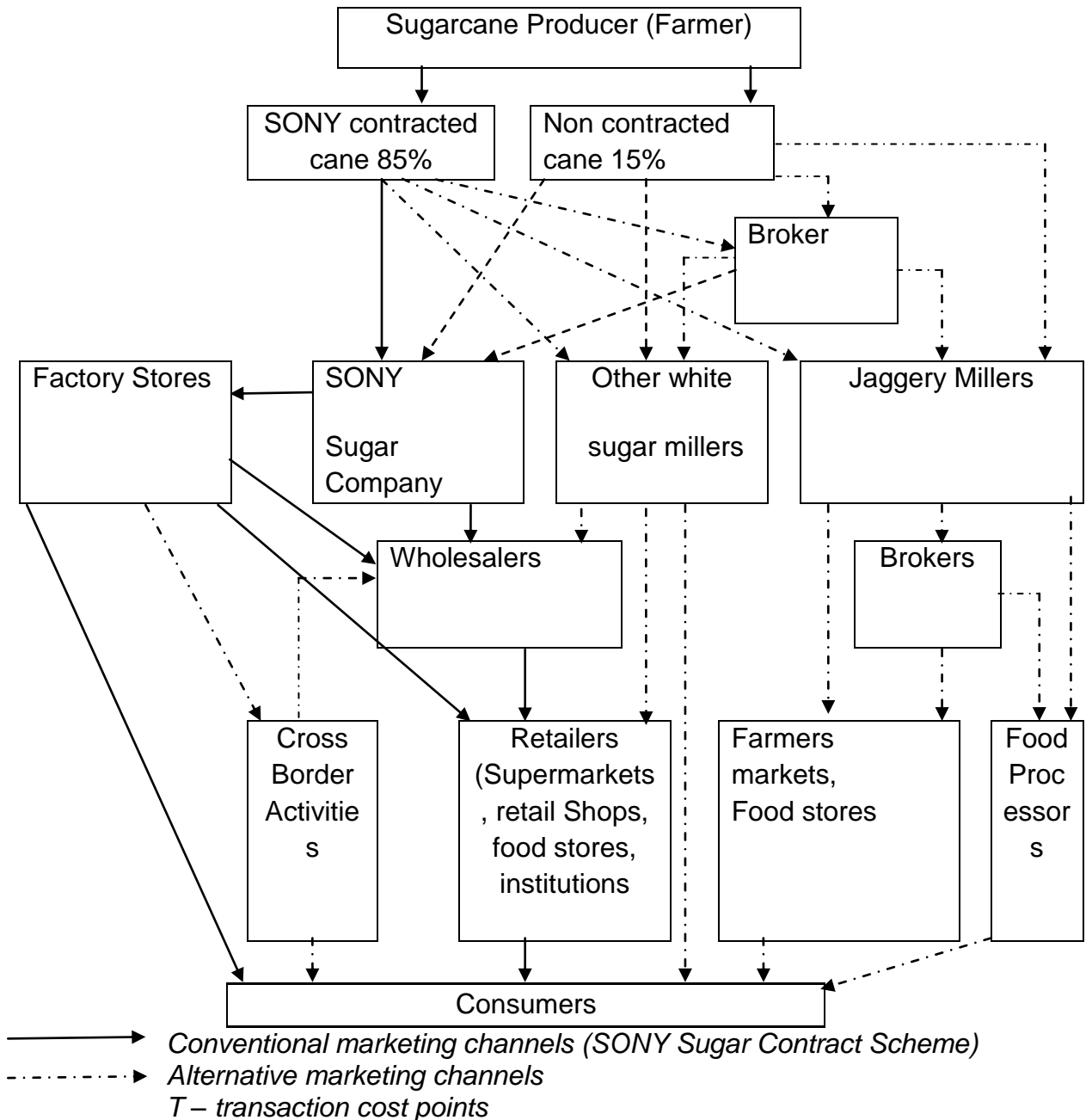
sugarcane (tc) in 1998/99 to 464,754tc in 2011/12 against a target of 651,600tc; while the non-contract farming has been on the rise from 45,133tc to 81,338tc over the same period.

The continuous production shortfalls would hurt the sugar industry in Kenya; since the country is already a net importer of sugar to meet the domestic consumption (see Appendix.11). Furthermore, Kenya has been surviving because of successfully negotiating for an extension of COMESA sugar imports safeguard. However, the safeguard measures will be coming to an end in February 2014, by which time the industry is expected to have restructured and become globally competitive (see Appendix.9).

There are two types of sugarcane production and marketing channels for SONY sugarcane farmers. The formal system where SONY contracted growers produce sugarcane and market through the SONY Sugar Company channels, and the informal system where the non-contracted sugarcane is produced and marketed either to the spot market (jaggery processors) or to the miller through middlemen or the producers themselves. Figure 1.2 shows the production and marketing channels for sugarcane farmers in Migori County. The continuous lines indicate the direction of flow of sugarcane from the growers to the millers and sugar from the millers to the final consumers in the formal existing production and marketing system. The broken lines indicate the direction of flow of sugarcane from growers to the millers and sugar from the millers to the final consumers in the informal production and marketing system. In the formal marketing system, the sugarcane is grown by the SONY Sugar Contract scheme farmers who sell the produce to the company for processing. The company then processes the produce into sugar which is then either stored in the company warehouses or sold to wholesalers and retailers. Some traders may be buying from the factory and wholesalers and selling to neighbouring countries (Informal Cross Border Trade). However, Kenya is not self-sufficient in sugar production and some sugar is officially imported to bridge the consumption deficit of about 200,000 tons per year (see Appendix.11). The retailers pass the commodity to the ultimate consumers.

Contracted sugarcane farmers are not expected to deal in the informal marketing system. However, there is some non-compliance and some SONY contracted sugarcane is sold to other white sugar millers and Jaggery processors directly or

Figure 1.2 Diagram of alternative and existing production and marketing channels for sugarcane/sugar in Migori District



Source: Author's compilation

through brokers. Some non-contracted cane is also sold to the SONY Sugar Company, other white sugar millers and Jaggery millers, either directly or through

brokers. The white sugar millers then sell the processed sugar to wholesalers and retailers who subsequently pass it on to consumers. On the other hand, Jaggery millers sell the brown sugar in the farmers' markets, food stores and to food processors, either directly or through brokers who in turn pass it on to the consumers.

Several studies have been carried out on contract farming in crop and livestock production. Past studies on contract farming have been carried out on costs of production and how they affect the performance of agribusiness firms in horticultural export crops e.g. mangoes, passion fruits, potatoes, and poultry value chains (Strohm and Hoeffler, 2006). They generally indicate that contract farming is an important and successful mechanism in accomplishing several tasks, such as delivering products as demanded by export markets and high-end domestic markets. Contractual arrangements assure producers certainty of market outlet, provision of essential productive inputs, transport facilities and extension services (Warning and Hoo, 2000). The agribusiness processing firms also provide credit to producers since the crops that they purchase are costly to produce per hectare than the traditional crops. The cash crops usually require a large, strict, intensive and specific input regimes including labour, which may not be met by smallholder family resources alone (Key and Runsten, 1999). However, some problems have also been associated with formal contracts. Issues which remain questionable on contract farming refer mainly to disadvantages to the farmers that are embedded in the contractual arrangements, e.g., farmers' loss of autonomy, increased production risks, and increased market power for the agribusiness firms, thus leading to reduced producer income (Kirsten and Sartorius, 2002).

However, on the side of smallholder producers, most studies do not point out much on socio-economic issues that affect the performance of sugarcane contract farmers. This study adds to the growing body of knowledge by incorporating participatory and related methods in the evaluation of the factors that influence contract participation and the impact of contract farming on farm households. The study focuses on the performance of the SONY Sugar Company sugarcane contract farming.

The study was motivated by the desire to evaluate the perception that SONY Sugar contract farming was profitable and thus able to attract or maintain participation in the current economic challenges. The case study evaluated the factors that influence participation in SONY contract scheme and the impact of participation on farm households. Available literature indicates that no studies focusing on the evaluation of farmers' participation in sugarcane contract farming and the impact of contract farming on farm households have been carried out in Migori County.

Given the contradicting views that contract farming can be both beneficial and disadvantageous at the same time, the extent to which smallholder sugarcane farmer's welfare is improved by participating in a contract farming scheme thus remains debatable. The study sought to contribute to that debate.

1.4 Objectives of the Study

1.4.1 Overall objective

The overall objective was to evaluate the factors that influence participation in a contract farming scheme and the impact of contract participation on sugarcane farm households, using Migori County as a case study.

1.4.2 Specific objectives

The specific objectives were:-

- (i) To characterise SONY Sugar Company contract farming scheme.
- (ii) To identify and evaluate the factors that influence participation in SONY contract farming scheme.
- (iii) To assess the impact of SONY contract farming on the farming households.

1.5 Hypotheses tested

The following hypotheses were examined and tested:

- (i) H1: Household and institutional characteristics have no significant influence on participation in the SONY Sugarcane contract farming scheme.

- (ii) H2: There is no significant difference in household and agricultural assets between contract and non-contract farming households.

It is thus hypothesised that household and institutional characteristics influence the farmer's probability of participation or non-participation in the SONY Sugar contract scheme. It is also hypothesised that contract farming affects farming households' welfare.

1.6 Justification of the Study

Contract farming is a significant feature of the sugar industry in Kenya. Therefore, understanding the factors that influence contract sugarcane production is important.

Sugarcane contract farming is seen as a means of promoting sugar development in Kenya. However, the Kenya Government's effort to promote the development of the sugar industry through contract farming in the sugarcane producing zones has not been successful. The area under sugarcane production has not increased to expected levels that would meet the consumption demand. The poor performance of the sugar industry has been manifested in persistent production shortfalls since 1993 and sugar imports in Kenya still represent a fairly significant proportion of domestic consumption (see Appendix.11). Foreign exchange on sugar imports could be saved, if the country produced enough sugar to meet domestic demand and even have surplus for export.

The SONY Sugar Company contributes 15% of the sugar produced in Kenya and is only second to Mumias Sugar Company that contributes 53% (GOK, 2007). The performance of the company therefore has a significant impact on the sugar industry in Kenya. However, the company has been experiencing production shortfalls, with sugarcane delivery to the factory by contracted farmers generally declining between 1998/99 and 2011/12 (see Appendix.3). Understanding the factors that influence participation in sugarcane contract farming is expected to shed some light on the causes of this declining trend in sugarcane deliveries to the SONY Sugar Company by the contracted sugarcane producers. The results are expected to be useful to policy makers when deciding on how to formulate

appropriate policy interventions that can promote the establishment of strong and viable contract farming schemes. They can also help the farmers and industry players to make participation decisions from an informed point of view.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

Contract farming has been defined as an “agreement between farmers and agribusiness firms for the production and supply of agricultural produce under forward agreements, frequently at predetermined prices” (Eaton and Shepherd, 2001). Contract farming has also been described as a way of sharing risks between producers and agro-processing firms as a condition to avoid market failure (Hardaker, Huirne, Anderson, and Lien, 2007). Contract farming is thus an institutional arrangement that is expected to minimize transaction costs (Dorward, 2001; Kirsten and Sartorius, 2002; Da Silva, 2005).

Recent literature on Transaction Cost Economics (TCE) has helped to understand the advantages of contracting and integration over the more traditional spot markets and commodity brokers (Sykuta, Klein, and Harvey, 2007). Transaction costs are incurred whenever goods and services are transferred (by means of technology) between individual entities or groups through contracts. Transaction Costs Economics helps in understanding how to minimize these costs. TCE can be applied to explain contractual practices in both formal and informal marketing arrangements in virtually all agricultural commodities.

Transaction Costs Economics (TCE) is an offshoot of the New Institutional Economics (NIE) and Economics of Organization literature. New Institutional Economics was first stated by Coase (1937) in his article titled “The Nature of the Firm” where he suggested that market exchange is not costless and may involve costs, such as information search, bargaining and signing of contracts. He outlined the importance of transaction costs, explaining that firms emerge to economize on transaction costs of market exchange. Many agro-processing firms use vertical integration to avoid pitfalls of transaction costs, such as poor quality, highly priced produce, farm supplies not readily available, and fluctuating yields and quality.

Agricultural enterprises are typically risky businesses, and farmers engage in contract farming to share and cope with risks more effectively (Hardaker, Huirne, Anderson, and Lien, 2007). Contractual arrangements facilitate distribution of risks between agro-processing firms and farmers. The agro-processing firms bear the risks associated with marketing while the farmers bear the risks of production, depending on the preconditions of the contractual arrangement. The farmers commit themselves to produce and sell a specified amount of commodity, while the agro-processing firm commits itself to buy at an agreed price. The result is a steady flow of raw materials at predetermined prices for the agribusiness firms, thus facilitating optimal plant capacity utilization.

2.2 Theories of contract farming and associated costs

Available literature, as reviewed later on, shows that the costs of contract participation by agribusiness firms and smallholder farmers can be explained through governance costs, transaction costs, incomplete contract and principal-agent/incentive contract theories. These concepts are explained hereafter.

2.2.1. The governance costs/transaction costs concepts

Governance structures have been defined as mechanisms mainly for settling *ex post* (i.e., after contract agreement) disputes. The theory predicts that forward looking agents adopt the governance structures that are best suited to handle the transaction(s) they carry between them (Williamson, 1996). Hendrikse (2003) defines a governance structure to mean the set of rules by which an exchange is administered. Contractual relations are therefore embedded in governance structures (Foss and Klein, 2008). Governance structures can be seen as a continuum ranging from spot market to hierarchy (or vertical integration) in which contracts are a typical hybrid governance structure (Menard, 2004).

Whereas the governance costs rise with complex and hierarchical governance structures, TCE explains how economic actors choose from a set of feasible institutional alternatives and governance structures that safeguard their transactions at the lowest costs (Bijman, 2008). Governance costs include both transformation and pure transaction costs. Governance costs therefore refer to all

costs incurred during a transaction in a specific contractual arrangement, and they vary across different arrangements.

Transaction costs have been defined in several ways. However this study adopts the widely accepted definition that classifies transaction costs into observable and unobservable costs (De Silva and Ratnadiwakara, 2008). Observable transaction costs are visible when an economic exchange takes place. They include tangible costs like transport, handling, packaging, storage, spoilage, etc. Unobservable transaction costs include intangible or fixed transaction costs like the cost of information search, bargaining, screening, monitoring, coordination, and enforcement of contracts. According to Kirsten and Vink (2005), transaction costs can also be described as “costs of running an economic system”. They are costs other than the money price that are incurred in trading or exchanging goods and services. On the other hand, transformation costs are costs of transforming inputs (e.g. labour, capital, land and / or raw materials) into outputs.

TCE provides literature that explains the importance of choice of contracts between market participants. Transaction costs can determine the ease or difficulty with which contracts are made. Therefore, TCE helps in understanding the efforts made by organizations to minimize transaction costs. Issues which arise are incomplete contracts or “hold-up” problem, the “principal – agent problem”, and the adverse selection problem. The concepts are described below.

2.2.2. The Incomplete Contracts Concept

Studies on contract theory show how economic actors often engage in contractual agreements generally often with asymmetric information. Many economists agree that actual contracts are or appear quite incomplete, being vague or silent on important variables. However, there is no clear definition of what really constitutes an incomplete contract (Schmitz, 2001). The incomplete contracts problem refers to the design of contracts when important variables, such as quality of traded goods, cannot be observed or verified by a court of law effectively, thus making them “incomplete contracts” (Foss and Klein, 2008). Wilkinson (2005) argues that although contracts are an important method of conducting business, they are essentially incomplete due to the problem of bounded rationality (i.e., it is

impossible to foresee every future contingency) of the contracting parties and uncertainty about the future states of nature. This implies that SONY sugar company as an agribusiness firm may have excellent knowledge of markets than smallholders and thus may benefit more from the contract.

2.2.3. The principal–agent, incentive contracts concept and agency theory of exchange

The incentive contracts concept refers to a situation where a principal that is not able to observe an agent's action can induce the agent to take the right action by designing an incentive scheme. This may induce the agent to work hard at maximizing whatever the principal wants maximized (Omar, 2002). It also refers to the problem of the principal motivating an agent to take a particular course of action which is not observable. Contract farming can also be considered a "Principal – Agent" problem because the buyer (the principal) and the farmer (the agent) cooperate to produce a crop (Warning and Hoo, 2000). The Agency theory of exchange on the other hand, is based on the idea that a farmer, being an agent, may acquire private benefits in exchange for not "holding up" a trading partner and this improves the latter's incentive for transaction specific investments. A "hold up" problem exists where two parties (such as a farmer and a manufacturer) may be able to work most efficiently by cooperating, but refrain from doing so due to concerns that they may give the other party increased bargaining power, and thereby reduce their own profits. Therefore, contract farming should thrive well when incentives for both the principal [SONY Sugar Company] and the agent [the Out-grower farmer] exist.

2.3 Agricultural contracts in Africa

According to Eaton and Shepherd (2001), agreements usually in the form of a written contract or verbal understanding, cover responsibilities and obligations for each party, the manner of enforcing the agreement, and the remedial measures to be undertaken if the contract breaks down. Different contractual arrangements exist for various agricultural commodities in Africa. Contract farming is emerging as an important linkage between smallholder farmers and markets by providing services, such as knowledge of potential markets, technical advice on grades and

standards, and credit to acquire the necessary equipment and production inputs to increase farmer income (Mwape, Abaru, and Place, 2005). For example, a study in Uganda indicated that hot pepper farmers engaged in contract farming in Mukono District, obtained relatively higher incomes than their counterparts who were not involved in contract farming (Nalyongo and Abaru, 2004). Well managed contract farming offers a potential solution to some of the development problems of the agricultural sector in Africa.

Contracting can act as an institution to overcome barriers of entry to agribusiness industry by smallholder farmers, but certain measures need to be undertaken to ensure contract enforcement and to reduce transaction costs (Sartorius, Kirsten, and Masuku, 2003). Despite the many benefits in contractual marketing arrangements, often some contractual problems (such as high default on contracts by both sides) arise. Farmers at times avoid meeting their contractual obligations through side-selling to competing buyers and defaulting on repayments of their loans, and this is particularly common in cotton and horticultural production (Mwape, Abaru, and Place, 2005). Other cases of default are when farmers fail to conform to agreed-upon quality standards and/or quantities of produce, or when they make deliveries that did not follow the recommended practices. On the other hand, contractors default when they fail to pay the agreed price and/or buy less than the agreed quantity. Other contractual problems include exploitation of farmers noted particularly where the farmers are not well organized and have no alternative buyers or cannot easily change the crop, such as sugarcane or tree crops (Mwape, Abaru, and Place, 2005). Exploitation includes unilaterally changing the agreed standards, or giving the products lower grades so as to pay less, overpricing of inputs, including transport, and over-charging interest.

The major challenge for the agribusinesses and producers that results in higher transaction costs is enforceability due to weak contractual laws (Jaleta, Gabremedhin, and Hoekstra, 2009). Where there are laws that protect the agribusinesses and farmers, the former are usually reluctant to resolve disputes through the courts because it may be costly. Sometimes, cases take too long to be administered through the courts. In such cases, the arbitration of contract

farming disputes becomes difficult and agribusiness firms are likely to exclude potential investors in contract farming. The principal disadvantage associated with contract farming in developing countries is the high level of transaction costs, because supply arrangements involve large numbers of small scale farmers that are spatially dispersed, thus requiring high levels of inputs and support (Kirsten and Sartorius, 2002).

It is important that farming contracts, whether written or oral, comply with the minimal legal requirements that apply in a particular country, taking into account the prevailing practices and societal attitudes towards contract obligations (Likulunga, 2005). Studies in Africa indicate that contractual problems are increasingly being experienced, for example in Zambia; weaknesses of contract enforceability when the contract is breached are common for most commodities due to the long litigation process (Likulunga, 2005). In Malawi, contractual problems caused by weak regulatory and legislative environment have resulted in high levels of default (such as side-selling of contracted tobacco to intermediate buyers), poverty, and food insecurity (MASIP Secretariat Report, 2005).

In Ethiopia, diversionary sales (side-sale of output) particularly for food crops, also due to non-existent or weak contract enforcement mechanisms resulting in higher transaction costs of trade, have been reported (Jaleta, Gabremedhin, and Hoekstra, 2009). In South Africa, a majority of commodities appears to be procured by some form of production or marketing contract. For instance, according to Sartorius and Kirsten (2006), 100% of the supply of tobacco, sugarcane, cotton, timber, meat, poultry and eggs in South Africa is secured by some form of contracting, while, 78.5% of all fruit and vegetables processed are procured by some form of contracting. However, contractual constraints are still experienced even in South Africa, thus compromising price, yield and quality of produce (Sartorius and Kirsten, 2006).

2.4 Agricultural contracts in Kenya

Contract arrangements in Kenya have been widely used in the horticultural industry, smallholder tea, tobacco, sugarcane, and dairy industries. The Horticultural Crop Development Authority (HCDA) has facilitated private sector

development through a broad range of institutional and marketing arrangements. The arrangements include wide use of contract farming in which traders provide funding, price information and overall marketing services to farmers (Jaleta, Gabremedhin, and Hoekstra, 2009).

Govereh, Jayne, and Nyoro (1999) found evidence of positive spill over from out-grower arrangements among sugarcane farmers in Bungoma/Kakamega Districts. The study found that household participation in out-grower schemes was positively correlated to farmers' access to inputs on credit. This had a significant positive effect on food crop productivity.

Sautier, Vermeulen, Fok, and Bienabe, (2006) describe the Kenya export-oriented horticulture (fruits, vegetables, flowers) based on contract farming a "success story". Furthermore, diversification towards horticultural production in Kenya has resulted into the steady growth of the export market (English, Jaffee, and Okello, 2004; Minot and Ngigi, 2004).

Tschirley, Ayieko, Muendo, and Weber (2004) study the competitiveness of Kenya's domestic horticultural production and marketing system. They note that the effectiveness of contracts varies under different market settings and different market agents, and that the mere presence of contracts does not assure the sustainability of the trade relationship. They also note that as an institutional mechanism, contract farming requires a continuous adjustment process, according to the characteristics of the agents and the exogenous conditions they are facing. Non-price aspects of contracts, such as the frequency of transactions, promissory of back payment, input supply and technical assistance, have positive production efficiency and enhance sustainability of cooperation. Tschirley, Ayieko, Muendo, and Weber (2004) recommend that public policies and equity schemes must play a role in order for contract farming to become a suitable institution with positive results in terms of equity, efficiency and sustainability.

Gioe (2006) indicate that the well developed and dynamic private sector in Kenya has profitably marketed a wide range of horticultural products to diverse international markets through contract farming. The study notes that the minimal

government intervention has facilitated the sectoral growth through infrastructure development, incentives and support services, even though the sector still faces many challenges, such as expensive and difficult transportation, expensive telecommunication and insufficient supply of electricity. The challenges also include stringent phytosanitary requirements in the export market and other public and private standards that are increasingly pushing small rural farmers out of the horticultural value chain.

Crawford, Jayne, and Kelly (2006) examine out-grower or cooperative programs with interlinked input–credit-output market transactions and give examples of coffee cooperatives and sugarcane out-grower schemes in Kenya under this model. The study found that interlinked market transactions can improve coordination and reduce risks, just as an effective state-led input-credit market system can. The observation is supported by studies carried out by Govereh and Jayne (2003) as well as Jayne, Yamano, and Nyoro, (2004). However, the sustainability of the system requires that the out-grower company represents farmers and their interests. In cases where the sugarcane out-grower companies have vested interest, other than the farmers, management and operating costs structures can become uncompetitive and erode the incentives for farmers to remain in the scheme. The out-grower schemes work better with high value crops because (a) profitability is more apparent to farmers and (b) enough income is generated to cover costs of inefficiency and still leave enough surpluses to ensure that farmers get a reasonable return.

Strohm and Hoeffler, (2006) reviews existing literature and current activities concerning contract farming in five value chains in Kenya i.e. French beans, mangoes, passion fruits, potatoes and poultry. The report finds that product type, geographical location, access to infrastructure, socio-economic factors play a key role in influencing the performance of contract farming arrangements.

In other competing countries like South Africa, sugarcane cultivation is highly mechanized from planting to harvesting, loading and crushing. Inadequate mechanization of some operations in Kenya contributes to wastage and efficiency losses. Nyoro, Wanzala, and Awuor (2001) concluded that the future of

sugarcane production in Kenya lies in the reduction of sugar processing costs, which can be achieved by investing in appropriate technologies that are available to other competitors, such as Sudan.

2.5 Overall remarks on agricultural contracts

The above review shows that most of the studies have been on transformation costs, i.e., costs of transforming inputs (e.g. labour, capital, land and/or raw materials) into outputs. There have been some evaluations of transaction costs in contract marketing of export horticultural produce. However, the experience based on studies of high value horticultural export crops cannot be generalized for the SONY Sugarcane farmers.

The contract farming scheme can be modelled as a principle-agent game in which the principle say SONY Sugar Company works with the agent say a grower to produce say sugarcane. The company (SONY) chooses the smallholders with whom to contract and sets the terms of the contract, while the growers choose whether to participate. The combination of both choices will define the selection process for the farming contract. The benefits, whether in terms of improved welfare for the participants will depend on the contract terms and the socio-economic characteristics of the growers (Warning and Hoo, 2000). This is what motivated the researcher to evaluate whether the relationship between SONY Sugar Company through the contract scheme improves the welfare of the smallholder farmers and the factors that would constrain farmers from either remaining or exiting from the scheme.

2.6 Measuring SONY contract participation/non participation decision

The econometric analysis of participation decision was modelled based on random utility theory. Choice data generated using Stated Choice Methods (SCM) were analysed using a Random Utility and maximization model (Adamowicz, Boxall, Williams, and Louviere, 1998). The term Stated Choice Methods refers to a flexible approach to collecting preference data based on choices and rankings, whether full or partial from subjects in hypothetical situations (Adamowicz, Louviere, and Swait, 1998). The decision context and product descriptions are the

stimuli, and the individual's decision (which may be a choice, a ranking, or a quantity) is the elicited response. In this case, the objective was to face the farmer as a decision-maker with the choice of whether to contract sugarcane farming with SONY Sugar Company or not. The study applied the Random Utility model which has the following advantages (Adamowicz, Louviere, and Swait, 1998):- (i) control of the stimuli is in the researchers' hand, as opposed to the low level of control afforded by observing the real market place; (ii) control of the design matrix yields greater statistical efficiency and eliminates collinearity (unless explicitly built into the design); (iii) more robust models are obtained because wider attribute ranges can be applied than are found in real markets; (iv) introduction and/or removal of attributes are straight forward, which is difficult to accomplish in real markets.

Random utility theory was first proposed by Thurstone (1927) as the basis of models in which consumer judgements and decision making among pairs of offerings can be explained. Thurstone (1927) argued that consumers try to choose the offerings they like best, subject to constraints (e.g., income, time) just as in standard economic theory. The argument was that different probabilistic choice models can be derived by making different assumptions about the distribution errors (random component) e.g. a bivariate normal distribution, which yields the binary probit model. However, consumers may not choose what seems to the researchers to be the most preferred alternative. Therefore, choice can be explained by proposing a random element as a component of the consumer's utility function (Adamowicz, Louviere, and Swait, 1998), which can be explained as follows:

$$U_i = V_i + \varepsilon_i, \dots \dots \dots \text{Equation 2.1}$$

where U_i is the unobservable, true utility offering i ; V_i is the systematic (i.e. known) component of utility; and ε_i is the random component. The justification for the random component is that the researcher may omit variables or commit measurement errors, which may not attract the particular decision of the consumer. This random component allows the researcher to make probabilistic statements about consumer's behaviour. Therefore, the probability that a

consumer will choose the i -th offering from some set of competing offerings, say C , can be modelled as follows:-

$$P(i | C) = \Pr[U_i > U_j] = \Pr[(V_i + \varepsilon_i) > (V_j + \varepsilon_j)], \forall j \in C \dots\dots\dots \text{Equation 2.2}$$

2.7 Application of Models in the Current Study

This study evaluated the factors that influence participation in SONY contract farming scheme and its impact on farm households. A probit analysis and statistical analysis of data collected through participatory research procedures were employed in this study.

CHAPTER THREE METHODOLOGY

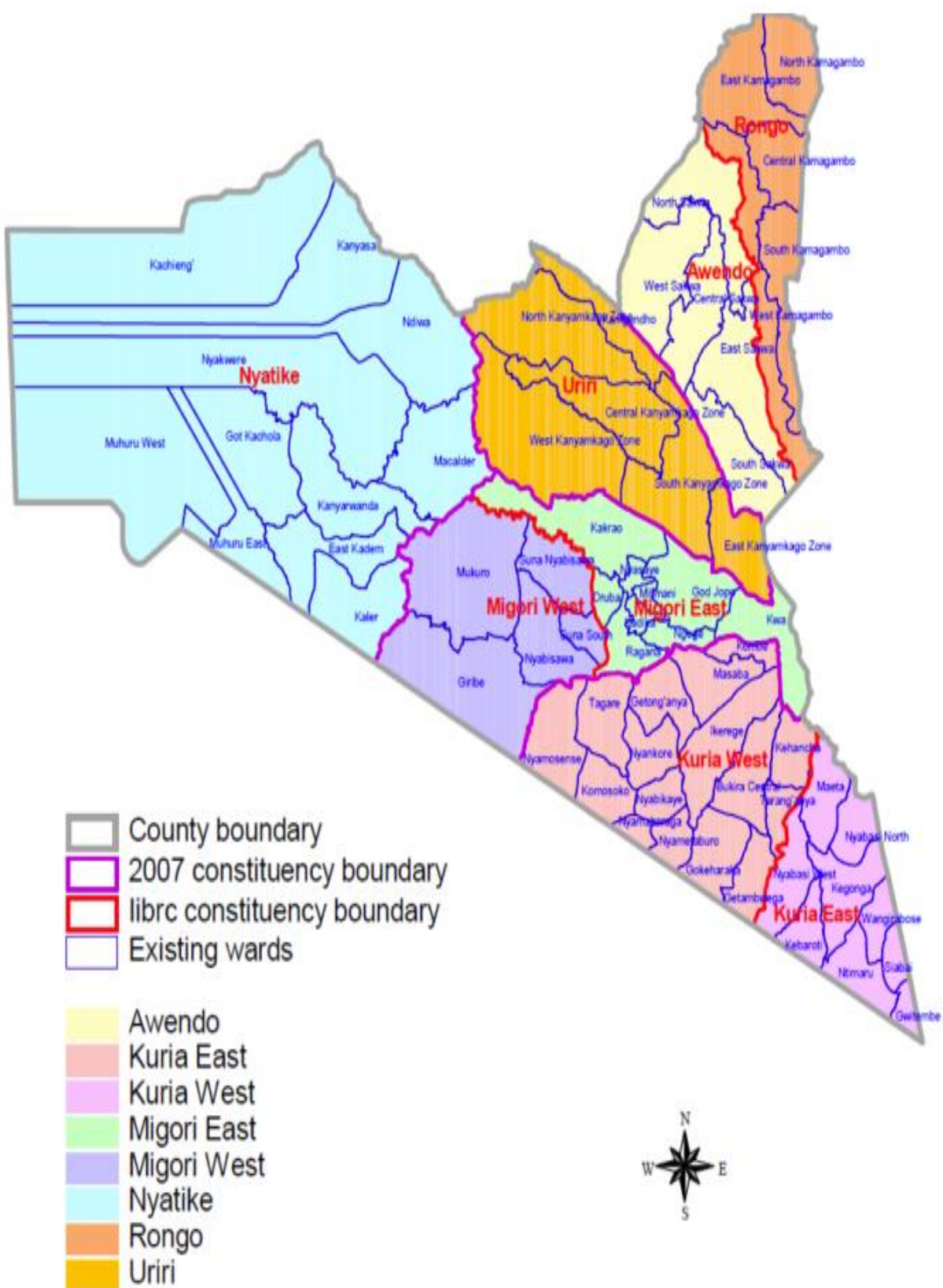
3.1 The Study Area

This study was undertaken in Migori County which is located in the South Western part of Kenya. The county consists of seven constituencies, namely Kuria East, Kuria West, Migori, Nyatike, Uriri, Awendo and Rongo (see Figure 3.1). The County borders Homa Bay and Kisii Counties to the North; Narok County to the East. It shares the Southern boundaries with Narok County and the Republic of Tanzania. On the Western boundaries are Homa Bay Counties and Lake Victoria. The county covers an area of 2,597km² of which 475km² are composed of Lake Victoria.

The climate is of mild equatorial type, modified by relief, altitude and proximity to Lake Victoria. The altitude ranges from 1,135m at the shores of Lake Victoria to 1700 m (PRSP Report, 2004). The County experiences bimodal rainfall pattern ranging from 700 mm to 2,200 mm per annum (PRSP Report, 2004). The long rains commence in February/March and continue up to June. The short rains start in July/August and end in November. Maximum temperature range between 26° C and 31 ° C, while minimum temperature range 14 ° C to 16 ° C. The soils range from deep red clay loam soils to black cotton soils towards the lake. Therefore the climate and soils are favourable for the cultivation of sugarcane, which is the main industrial crop. Other major crops are tobacco, cotton, maize, and beans (PRSP Report, 2004). The land tenure is mainly freehold and each landowner can be granted a freehold title deed in respect of their land parcels.

According to the national census 2009, the population of the County stands at 1,028,579 persons (KNBS, 2010). The population density is 353 per Km² and 43% of the population live below the poverty line. The strengths of Migori County include natural resources such as gold and water (Kuja and Migori rivers). The main economic activities include agriculture, fishing, manufacturing and mining.

Figure 3.1 Geographical boundaries of Migori County



Source: (CRA, 2010)

The immigration has contributed to the rising population trend which is attributed to the good agricultural soils; employment opportunities, e.g., the SONY Sugar Company Factory; the vibrant fishing industry; cross-border trade; and heavy land pressure in the neighbouring districts (PRSP Report, 2004).

Specifically, the study concentrated on the South Nyanza Sugarcane belt where the SONY Sugar Company operates a contract scheme. The scheme is categorized into seven sectors (1-7) depending on the distance to the factory and is managed through sector offices. However, the study only concentrated on Migori County covering sectors 1-4 where the SONY sugar company mainly operates.

3.2 Theoretical Framework and empirical specification

The theoretical framework for analysing contract farming was based on random utility theory. The probit model was employed to analyse the probability of participating in the SONY contract scheme and the effects on household and agricultural assets.

The nature of sugarcane contract farming in Migori County can be understood within the framework as elaborated in Williamson (1991), which describes different types of contractual forms. These contractual forms range from spot markets through bilateral contracts to vertical integration with hybrid and hierarchical forms of governance. Williamson (1996) further argues that if economies of scale and scope were held constant, the producers and traders would not only behave in an economically rational manner, but that they would also embrace cost-minimizing contract governance structures. The contractual form with the lowest governance costs (or with the highest 'transaction margin' of revenue over governance costs), would be preferred (Fundira, 2003). In this study, the farmers are faced with the choice of a governance structure which maximizes their utility. In other words, the farmers are faced with the choice of whether to enter into contract farming with SONY Sugar Company or not depending on whether this arrangement maximizes their utility.

Assuming that the farmers are risk-neutral in deciding whether to contract or not, and following Faltermeier and Abdulai (2009), the farmers would compare the utility derived from participation in SONY Contract scheme, denoted as $U^*(C)$ against the utility derived from non-contract participation, denoted as $U^*(NC)$. Participation then takes place if $U^*(C) > U^*(NC)$. The utility derived from participation can be said to be related to a set of explanatory variables (Z) as follows:

$$U_j^* = \gamma' z_i + \varepsilon_i, \dots\dots\dots\text{Equation 3.1}$$

where γ is a vector of parameters, while the error term ε with mean 0 and variance σ^2_ε takes care of the measurement errors and unobserved factors. The variables Z are the factors influencing participation in the contract scheme. Participation or non-participation in the scheme is observable but the utility derived is not observable. This is represented by $D_j = 1$, if the farmer participates in the scheme and 0 otherwise i.e. $D_j = 1$ if $U^*(C) > U^*(NC)$ and $D_j = 0$ if $U^*(C) \leq U^*(NC)$ respectively.

The probability of participation in the scheme is then represented as follows:-

$$\begin{aligned} \text{Prob}(D=1) &= D_j = 1 \text{ if } U_j^*(C) > U_j^*(NC) \\ &= \text{Pr}(\varepsilon_i > -\gamma' z_i) = 1 - F(-\gamma' z_i) \dots\dots\dots\text{Equation 3.2} \end{aligned}$$

for the j^{th} farm household where F represents the cumulative distribution function for ε . To link the participation decision, it is assumed that farmers are risk-neutral and that they will go for a governance structure which yields higher utility i.e. the farmer will participate in contract farming if $D_j^* = U_j^*(C) - U_j^*(NC) > 0$.

Modelling the probability of participation and the impact of participation on household wealth

A probit model was used to estimate the probability of participation. From equation 2.1, the utility derived from participation (U^*_j) was not observable. Only the choice of participation or non participation in the scheme was observable, and this can be represented by a latent variable D^*_j . The index function to estimate participation in contract farming, assuming a risk-neutral farmer, can be expressed as follows:-

$$D_j^* = \gamma X_j + \varepsilon_j \text{ (} j = \text{scheme participation, non scheme participation)}$$

Where $D_j = 1$ if $U_j^* > 0$ and $D_j = 0$ if $U_j^* \leq 0$Equation 3.3

D_j^* is a latent variable which denotes the difference in utility between participating in contract farming $U^*(C)$ and the utility from not participating $U^*(NC)$. The farmer will participate in contract farming if $D_j^* = U_j^*(C) - U_j^*(NC) > 0$. The term γX_j provides an estimate of the difference in utility from participating in contract farming $U_j^*(C) - U_j^*(NC)$ using the household characteristics, X_j are the independent variables which explain the participation decision, γ is a vector of parameters to be estimated, and ε_j is the error term with $\varepsilon \sim N(0, \sigma)$.

Thus the relationship between participation choice and household wealth (Y_i) can be analyzed through the reduced form specifications 3.3 and 3.4:

$$Y_i = X^l + \eta_i, \text{.....Equation 3.4}$$

Where Y_i denotes the household wealth, X^l is a vector of explanatory variables consisting of household characteristics and participation choice, η is the error term with $\eta \sim N(0, \sigma)$. From equation 3.3 and 3.4, the core equation to estimate the impact of participation in the contract scheme on household wealth (Y_i) can thus be specified such that:

$$Y_i = \beta X_i + \delta D_i + u_i, \text{.....Equation 3.5}$$

$$D_i = 1 \text{ if } D_i^* > 0 \text{ otherwise } D_i^* = 0$$

where,

Y_i is the indicator of welfare (household and farm assets); X_i the factors assumed to influence household wealth; D_i a dummy for participation or non participation ($D_i = 1$ for participation in the SONY contract scheme and 0 otherwise); β and δ are coefficients; and U_i the error term.

Model Specification

The probit model used to estimate participation in the SONY contract scheme was based on the assumptions of equation 2.2 and was specified as follows:-

$$\Pr (c_i=1 | z_i) = \Phi (\beta z_i) \dots \dots \dots \text{Equation 3.6}$$

Where Φ denotes the normal distribution, c_i indicates participation in the SONY Sugar Company contract farming scheme, z_i is a vector of exogenous determinants of participation, and β is a vector of coefficient estimates for the z_i .

The dependent variable was estimated to evaluate the factors which influence participation in the SONY Sugar contract farming scheme, which was a dummy variable equal to 1 if a farmer is contracted with SONY and equal to 0 otherwise. The regressors were household and institutional characteristics that influence participation: Gender = dummy variable equal to 1 if a farmer is male, 0 otherwise; Age = age of the household head (years); Risk perception = willingness to take risks, 1 if willing to take risks, and 0 otherwise; Production finance = dummy variable equals to 1 if received production finance from a financial institution in 5 yrs prior to the study, and 0 otherwise; Farm records = dummy variable equals to 1 if the farmer keeps farm records, and 0 otherwise; Household size = Number of persons in the household; Farm inputs = dummy variable equals to 1 if the farmer has received external farm input support, and 0 otherwise; Education = Number of years of schooling of the farmer; Agricultural assets = Value of agricultural assets owned by the farmer based on purchase price (Ksh) and straight-line depreciation assumption; House value = Estimated value of the farmers house based on floor space and construction materials of the house (Ksh); Farm size = Total farm size of the farmer (ha); and Sector office = distance between the farmers house and the SONY sugar company sector office (km) . The results of the probit model estimates are presented in Table 4.27.

3.3 Analytical Framework

The 2nd and 3rd objectives of determining the factors associated with participation and the effect of participation on household welfare was analysed in three stages. First, by describing the characteristics of all sugarcane farmers through descriptive statistics, then comparing key demographic and personal characteristics of contract and non-contract farmers, and finally analysing the impact of participation in the SONY contract scheme on welfare through Farmer

Group Discussions (FGDs), Key Informant Surveys (KISs) and other participatory research methods. The details are explained hereafter.

3.3.1. Description of household characteristics of the sugarcane farmers

Data analyses by use of SPSS computer package generated descriptive statistics for socio-economic characteristics of sugarcane farmers in Migori District, including means and variances. Descriptive statistics was obtained from a household survey for both contract and non-contract farmers. The two samples were pooled due to the small sample sizes, on the assumption that each explanatory variable for both groups is the same. This was carried out to identify key variables to compare contract and non-contract farmers. The results are presented in section 4.2.

3.3.2. Comparing key household characteristics of contract and non-contract farmers

This analysis addressed the objective of evaluating whether contract farmers benefit more in terms of household and agricultural assets than non-contract farmers. A paired sample t-test was used to compare the values of key demographic profiles and personal characteristics of contracted and non-contracted sugarcane growers. The SPSS 17.0 software generated the statistics to enable comparison of the contract and non-contract farmers.

3.3.3. Econometric analysis of participation

This analysis addressed the objective of assessing the impact of participation in SONY contract farming on household wealth as an indicator of welfare. From the results of t-test in Table 4.26, the wealth of contract farmers was found to be significantly higher than that of non-contract farmers. However, the fact that the growers could still gain improved household and agricultural assets even if they did not participate in the contract scheme had to be accounted for. As highlighted elsewhere, a probit model was used to estimate participation in the SONY contract scheme (see Table 4.27). Household characteristics were included in the model to control for observable differences between contracted and non-contracted farmers, such as differences in farm size, education, and age. The

welfare benefits of participation were evaluated through FGDs, KISs, and other participatory research methodologies.

3.4 Data sources and sampling procedure

3.4.1 Data sources

The study involved parties to the SONY sugarcane contract scheme, i.e. smallholder sugarcane farmers and agribusiness firms, including SONY Sugar Company. Primary data was collected using participatory methods and a survey carried out by the author (see Appendix.10).

The participatory research methodologies applied were the semi-structured Interviews to collect data from key informants (i.e. Key Informant Surveys, KISs) in the sugar industry, i.e. scientists, SONY Sugar Company, and other sugar manufacturers (see Appendix.3, Appendix.5 and Appendix.6). The focus group discussions (FGDs) were employed to collect data from farmers (see Appendix.7 and Appendix.8). The farmers interviewed were from Awendo, Uriri and Rongo Districts of Migori County where the SONY Sugar Company mainly operates a contract scheme.

Secondary Data (see Appendix.1) was collected to supplement the information collected through field survey. The secondary data was obtained from organizations involved in sugarcane input supply, produce marketing, government and private sector support organizations, such as Kenya Sugar Research Foundation (KESREF), Kenya Sugar Board (KSB), and Kenya Sugarcane Growers Association (KESGA) (see Appendix.1)

Data on farmer variables included socio-economic characteristics, sugarcane production, transportation and marketing. Data was also collected from SONY Sugar Company contract agreement (see Appendix.4), and from SONY Sugar Company employees and their agents (see Appendix.3). Such data consisted of organization and support structure of the contract scheme, features of the contracts, problems encountered in operating the contract farmers' schemes, and sustainability of the contract schemes. The data collected from support organizations (KSB, KESGA, and KESREF) were on the nature and extent of

support activities and challenges encountered during the support of contract schemes.

3.4.2 Sampling procedure

A stratified sampling procedure was used to collect socio-economic cross-sectional data through a household survey. A preliminary census was carried out to record all smallholder sugarcane producers in the SONY Sugar belt. From the scheme, 115 eligible contracted farmers were randomly selected from the list of 24,559 smallholder farmer participants who were registered by the SONY Sugar Company. The list was provided by planning officers from SONY Sugar Company. Another sample of 69 non-contracted sugarcane farmers was also randomly selected from a list of 4,613 provided by the village elders. Thus the total sample size was 184 farmers.

Data was collected from the respondents in two phases. In the first phase, cross-sectional data on socio-economic profiles of all the 184 farmers was collected. In the second phase, a representative sample of 30 sugarcane growers was drawn from the 184 farmers for focus group discussions and in-depth interviews (see Appendix.7 and Appendix.8). The purpose was to obtain detailed data on the nature of contractual arrangement, registration, sugarcane production, incentives, transaction costs and marketing costs. Data on the benefits of and problems in input procurement and marketing of the produce were also obtained.

CHAPTER FOUR RESULTS AND DISCUSSION

4.1 Introduction

This chapter begins by presenting the results of the nature of SONY contract scheme based on secondary data, farmer focus group discussions and face-to-face interviews with the SONY Sugar Company employees (see Appendix.1 to Appendix.11). Then it presents the descriptive statistics of combined SONY contract and non-contract farmers, based on the farm survey carried out by the author. This survey was carried out to identify key variables to be used in comparing SONY Contract and Non-contract farmers. The results of the comparison of key variables of SONY Sugar Company contract and non-contract farmers using a t-test are then presented (see Table 4.26). Finally, the results of the econometric analysis of the determinants of participation in SONY Contract scheme and the impact of participation on household wealth are presented (see Table 4.27).

4.2 Results on the characterization of the SONY contract scheme

Key industry players: The sugarcane millers involved were SONY Sugar Company (a government parastatal), Kibos Sugar Company, Kitere sugar mills and individual sugar millers who crushed sugarcane for jaggery processing. However, only the SONY Sugar Company operates a farming contract scheme covering the production, purchasing and marketing of the produce on behalf of the sugarcane growers. The company provides production inputs on credit to the contracted farmers and then recovers the loans from the proceeds after harvest. The contractor's role also involves the final processing of sugarcane and selling of the final products to the consumers, either locally or abroad. On the other hand, the sugarcane farmers comprise of contracted and non-contracted growers. They are key industry players because they produce the sugarcane crop and sell it to the processing companies. By the end of financial year 2011/2012, there were about 29,552 SONY sugar company contracted growers and 5,173 non-contracted farmers who delivered sugarcane to the factory [464,754 tons and 81,338 tons respectively] (see Appendix.3).

The rules governing the sugarcane production and exchange processes were found to have been set out in the Sugar Act by the government. The growers have formed Kenya Sugarcane Growers Association (KESGA) to champion their rights, particularly on the pricing issues. The Sugar Parliamentary Committee, the Sugar Arbitration Tribunal, and the Kenya Sugar Board are the government oversight bodies that play a key role in providing regulations that govern sugarcane production, processing and marketing.

Institutions and their attributes: The contractual arrangements identified in the sugarcane exchange processes were of formal and informal types. The formal contractual arrangements were: (a) between the SONY Sugar Company, and the farmers, (b) between the government and the SONY Sugar Company, and (c) between the government and the farmers. The formal contractual arrangements between the SONY Sugar Company and the sugarcane farmers were described in a contract document signed between the growers and the company (see Appendix.4). The findings from the analysis of the SONY Sugar Company contract scheme are presented hereafter.

The SONY Sugar Company/Farmer Agreement [The contract]: The SONY sugar company contract scheme was found to be a 5 year or 3 sugarcane harvest agreement, in which the company committed itself to purchase sugarcane from the farmers, while the farmers committed themselves to grow the sugarcane for the purposes of selling to the company. The more salient features of the SONY Sugar Company contract with out-growers and some emerging issues are highlighted hereafter.

First, the agreement is a 5 year contract covering one plant and two ratoon crop harvests for which the growers could withdraw by giving the company a two year written notice. However, the company was entitled to recover all debts arising from the contractual arrangement before the grower could be discharged from the agreement. Sugarcane matures in less than 2 years and by withdrawing the farmer would be disadvantaged since another crop would be due for harvest. Credit for sugarcane development was extended to the growers by the company.

However, according to the contract agreement, the company was entitled to suspend the provision if at any point the company suspected that the sales proceeds from the next sugarcane harvest of the out-grower would be insufficient to reimburse the company.

Sugarcane growing like all other agricultural production exhibits high risks and uncertainties which the company ought to cover under an insurance scheme on behalf of the growers. However, the company does not have such a scheme. During focus group discussions, the farmers indicated that they were bearing all the transaction costs and risks arising mainly from sugarcane cut but not transported due to bad roads, spillage during transportation, and losses due to breakdown of transport machinery or accidents. Furthermore, if the crop was rejected at the buying point, usually at the reception of the factory gate, for whatever reason, the company was entitled to return the sugarcane at the Out-growers expense. The contract document specifies that the company determines the criteria to reject or accept the sugarcane from the Out-growers of any sugarcane which has been burnt, is of lower quality (purity below 83%), has been harvested by persons other than the company or its agents, has varietal difference from high quality seedcane supplied by the company, and has not been delivered to the company on the due date. The responsibility of running the factory operations belongs to the Company. However, the farmers have to bear any risks in case the factory operations are suspended because of weather conditions or because of maintenance, replacement or repair of its equipment and machinery. The company is only required to give one week notice of intention to stop operating and two weeks' notice of intention to start routine milling operations.

The cane agreement specifies that the sugarcane should be weighed on arrival at the buying point, which is at the reception of the factory gate or any other place designated at the discretion of the company. However, the government recommends that the sugarcane be weighed at the farm or close to the farms, but this is not being adhered to (KLR, 2001).

The Law provides for the sugarcane farmers to form Out-grower institutions to take care of the farmer's interest and coordinate production of sugarcane through collective action (KLR, 2001). Collective action is the voluntary action taken by a group to achieve common interest and the members can act directly on their own or through an organization (IFPRI, 2004). Through collective action, reliable linkages are formed between the farmers and the Company which have a potentially high impact on household welfare (Ouma, Jagwe, Obare, and Abele, 2009). To this end, the farmers in Migori County formed SONY Out-growers Company (SOC). However, the Company collapsed due to mismanagement, thus potentially increasing the farmer's transaction costs, individual risks and weakening their position in negotiating processes to protect their interests.

The agreement recognizes the role of government as a regulator and allows for the termination of the SONY Sugar Company Contract in the event that the government imposes conditions or decrees that are inconsistent with the terms of the contract. In that case, the parties to the contract would be required to modify the agreement terms, as may be recommended by a government appointed agency or court of Law.

By this contract, the growers are also required to take responsibility for all equipment, machinery, staff and labour for operations performed by the Company on their plots and the company is the sole judge to determine the operational costs to charge the growers. In the event that the growers are unable to carry out land preparation, plant and maintain the sugarcane crop in the contracted plot and as required, the company has the option of carrying out all or any operation which the company considers necessary and then deduct the costs of the extra operations from the payment made for the Out-growers' sugarcane harvest. The company also extends production credit and solely determines the credit interest rate to be charged. The credit interest is deducted from the Out-growers first cane harvest.

From focus group discussions, it was indicated that the price for the value of the Out-grower's sugarcane would be officially fixed by the government. According to the agreement, the value of the Out-grower's sugarcane is also supposed to be

paid within 30 days of cane delivery to the factory. However, the law requires that payment for sugarcane delivered should be effected within fourteen days of delivery of the cane and that any delivery thereafter, attracts an interest at the rate of twelve per cent per annum (GOK, 2011).

It is the responsibility of the Out-growers to maintain sugarcane plots to ensure satisfactory yield of sugarcane. On the other hand, the company is supposed to supply all goods and services specified in the agreement at a fee. The fee charged is at the discretion of the company. A penalty fee for salvaging the crop (i.e. compulsory weeding) is charged where the Out-growers fails to carry out the weeding, and this is deducted from the value of the Out-growers produce, after notifying the defaulter by hand delivery or through a registered mail within 7 days of such notice. The company also has the discretion of charging the cost of any other administrative and overheads from work, goods and services rendered to the contracted Out-growers, but this is not predetermined or fixed in the agreement to enable the growers to know the costs. Again, the company is only required to notify the Out-growers at least 7 days before the proposed charges are due to take effect.

The area the Out-growers commit for sugarcane production is predetermined and it is upon the contracted farmers to clear such areas for planting within 6 months from the date of signing the contract. The grower is also obliged to plant the high quality seed cane which is delivered at the plot or near the plot, depending on access conditions (roads). During focus group discussions, the farmers said that at times the cane is delivered far away from the plot, and the farmers have to incur extra transaction costs to deliver the cane to their plots.

According to the agreement, the Out-growers are not supposed to dispose of contracted sugarcane to any other person without consent from the company, but defaulting farmers occasionally sell their sugarcane to the syndicate groups or for jaggery processing. As such, the company is under constant threat from the farmers and other competitors.

The Out-growers or their representatives are supposed to witness the condition of the sugarcane at the time of delivery and obtain the net weight of the cane delivered and accepted by the company. The company employees interviewed indicated that more often the growers try to avoid transaction costs associated with witnessing the condition at their own risk and end up complaining of faulty weighing and weighing machines later.

It is the discretion of the company to determine when to harvest, load and transport sugarcane to the factory and also the cost of operations to deduct from the sugarcane payment. Due to the threat of “poaching” by jaggery processors, the syndicate traders and other milling plants, and especially when there is a shortage of sugarcane, there is a tendency for the company to harvest underage sugarcane. The farmers perceive this as a loss since underage sugarcane weighs much lower than mature cane.

The company cultivates and harvests the sugarcane in blocks. Therefore a field not harvested in time may hinder access to other plots. According to the contract document the company may cut any portion of cane where the Out-grower fails to harvest the sugarcane at the company appointed time, to provide access to other Out-grower’s plots and not be liable to any loss or damage. The Out-growers bear the costs.

When the land is under contract, the grower is not allowed to assign the land to any other activity without the consent of the company. This implies that once the Out-growers commit their land for contracting, it may not be possible to diversify through intercropping with other crops without the company’s consent. During focus group discussions the farmers were of the opinion that they should be allowed to intercrop with low canopy crops while the sugarcane canopy was still low to maximize on their land by harvesting a second crop.

Dispute resolution in the agreement is to be made through a single arbiter appointed by the Chairman of the Law Society of Kenya in accordance with the provisions of the Arbitration Act Chapter 49 of the Laws of Kenya. However, enforcement of these laws has not been easy due to the side-selling (“poaching”)

problem. The contractual arrangements rely more upon threat of termination of the contract and court action than verification by a third party. As such, trust still plays an important role to ensure success of the contractual relationship. Fafchamps and Minten (1999) conclude that trust based relationships can be a dominant contract enforcement mechanism.

Activities and their attributes analysis: The input and product markets were linked in the provision of inputs in an arrangement expected to guarantee credit repayment for SONY Sugar Company. These “inter-locking” exchanges minimised enforcement costs and were scale neutral in the sense that all farmers, regardless of their status, had equal access to the required inputs, as long as they were registered as contracted farmers. The inputs were supplied by the company on loan to guarantee yield and quality. Arguably, economies of scale were achieved in the purchase of inputs in bulk by the sugar company, which were then distributed to farmers.

Post harvest handling and exchange processes: The contracted farmers were registered according to zones. This was done to achieve joint operations where all equipments are moved to one zone to facilitate cultivation, harvesting, loading and transportation to the factory to reduce transaction costs. After harvesting, the company provides specialized sugarcane transport facilities to avoid spillage and sugarcane losses. The special transportation trucks for sugarcane delivery require considerably high investment. The company transports the sugarcane as part of the services provided to farmers at a cost.

The study found that the contracted sugarcane farmers were experiencing a number of problems including high transaction costs arising from poor contract terms and conditions. They coped with some of these problems by “side-selling” their sugarcane to SONY Sugar Company competitors.

4.3 Socio-economic characteristics of sugarcane growers

The results from the household survey on socio-economic characteristics of sugarcane growers in the study area are presented and discussed below.

Table 4.1 presents results on the gender of the respondents and shows that the majority were males (79.8%); the rest were females.

Table 4.1. Gender of respondents (farmers)

	Frequency	Percent
Male	146	79.8
Female	37	20.2
Total	183	100.0

Source: Author's compilation

Table 4.2 presents the marital status of the respondents. With regard to the marital status of the respondents, the majority (85.2%) were married, while 10.4% were single, and 3.8% were either divorced or widowed.

Table 4.2. Marital status of respondents (farmers)

	Frequency	Percent
Single	19	10.4
Married	156	85.2
Divorce	1	0.5
widow(er)	6	3.3
Missing	1	0.5
Total	183	100.0

Source: Author's compilation

Table 4.3 presents the age of the respondents. The table shows that 21.7 % of

Table 4.3. Age of the respondents

	Frequency	Percent
≤30yrs	40	21.7
31-40yrs	60	32.6
41-50yrs	51	27.7
51-60	10	5.4
≥60yrs	21	11.4
Missing	2	1.1
Total	184	100.0

Source: Author's compilation

the respondents were of age 30 and below, 32.6% were between 31 and 40 years of age, 27.7% were aged between 41 and 50 years, 5.4% were aged between 51 and 60 years, and 11.4% were of age 60 and above. About 1.1% did not respond. Therefore, the majority of the respondents were above 30 years old. Generally, the majority of the interviewed farmers (87.4%) were in the productive age of below 60 years of age.

Table 4.4 presents the number of years that the respondents had lived on their farms and shows that the majority of the respondents (89.1%) had lived in their area for more than 20 years, with 6% for 11 to 20 years. About 2.7% had lived in the area for less than 10 years and 2.2% did not respond to this question. Therefore, the majority of the respondents knew the place well and could give reliable information as sought by the study.

Table 4.4. Years the respondents have lived on the farm

	Frequency	Percent
>20 years	164	89.1
11 - 20 years	11	6.0
<10 years	5	2.7
Missing	4	2.2
Total	184	100.0

Source: Author's compilation

Table 4.5 presents the total area of land cultivated by the respondents and shows

Table 4.5 Total area of the farm (hectares)

	Frequency	Percent
0.1 to 5	127	69
5.1 to 10	41	22.3
10.1 to 15	5	2.7
15.1 to 20	2	1.1
Above 20	7	3.8
Missing	2	1.1
Total	184	100

Source: Author's compilation

that 69% of the respondents' land ranged from 0.1 to 5 hectares, while 22.3% was between 5.1 and 10 hectares. About 2.7% and 1.1% was between 10.1 and 15 hectares and 15.1 to 20 hectares respectively and 3.8% was above 20 hectares. Therefore, the farmers had enough land to cultivate sugarcane.

Table 4.6 presents the results on the ownership of land cultivated by the respondent. It shows that 67.9% of the respondents were the owners of the land, 30.4% were children of the owner of the land, and 1.1% of the respondents were tenants while 0.5% did not give their response to the query.

Table 4.6. Land ownership

	Frequency	Percent
Owner	125	67.9
child of the owner	56	30.4
Tenants	2	1.1
Missing	1	0.5
Total	184	100.0

Source: Author's compilation

Table 4.7 presents the features of the respondents' house and shows that the majority of the respondents (80.4%) were staying in semi permanent houses, with 17.9% staying in permanent houses. About 1.6% did not respond.

Table 4.7. Features of landowner's house

	Frequency	Percent
Permanent	33	17.9
semi permanent	148	80.4
Missing	3	1.6
Total	184	100.0

Source: Author's compilation

Table 4.8 presents the age and number of dependants living in the household based on gender. On the basis of the gender and the number of dependants living in the household who were less than 15 years old: (i) 52.2% had 1 to 3 dependants who were males, (ii) 29.9% did not have dependants who were

males, (iii) 13% had 4 to 6 male dependants, (iv) 4.9% had more than 6 male dependants, (v) 53.7% had 1 to 3 female dependants, (vi) 28.8% had none, (vii) 13.1% had 4 to 6 females, and finally 4.4% had more than 6 females aged below 15 years living in the household.

On the basis of the gender and the number of dependants living in the household who were between 15-64 years old: (i) 51.1% had 1 to 3 dependants who were males, (ii) 34.8% did not have dependants who were males, (iii) 8.1% had 4 to 6 male dependants, (iv) 6% had more than 6 male dependants, (v) 69% had 1 to 3 female dependants, (vi) 21.7% had none, (vii) 7.1% had 4 to 6 females, and finally 2.2% had more than 6 females aged between 15-64 years living in the household.

Table 4.8. Age and number of dependants living in the household by gender

No.	Age												
	Male		Female		Male		Female		Female		Male		
	<15yrs	<15yrs	<15yrs	<15yrs	15-64yrs	15-64 yrs	15-64 yrs	15-64 yrs	> 65yrs	> 65yrs	> 65yrs	> 65yrs	
Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
None	55	29.9	53	28.8	64	34.8	40	21.7	176	95.7	177	96.2	
1 to 3	96	52.2	99	53.7	94	51.1	127	69	8	4.3	7	3.8	
4 to 6	24	13	24	13.1	15	8.1	13	7.1	0	0	0	0	
> 6	9	4.9	8	4.4	11	6	4	2.2	0	0	0	0	
Total	184	100	184	100	184	100	184	100	184	100	184	100	

Source: Author's compilation

On the basis of the gender and the number of dependants above the age of 65 years who were living in the household, the table shows that 4.3% of the respondents had 1 to 3 female dependants living in the household, 3.8% had 1 to 3 male dependants living in the household, while none had more than 3 dependants who were over 65 years old living in the household. 95.7% and 96.2% had no female and male dependants aged over 65 years respectively.

Table 4.9 presents the education level of the male and female household heads. From the results, most of the female household heads (49.5%) had their highest level of education as "standard 8 and below" while 22.8% of the female household

heads had their education level as “Form 1-4”. The results also show that 15.2% could not read or write and 8.7% did not respond. About 3.8% had “college education and above”.

For the male Household Heads, the results in Table 4.9 shows that most of them (38%) had “Standard 8 and below” level of education, and 23.4% had their highest level of education as “Form 1-4”. About 17.4% of them could not read and write, while 11.4% had attended colleges and other institutions of higher learning. About 8.7% female headed 4.9 male headed households did not respond to that question. From the above results, it can be argued that the illiteracy rates were higher in female headed households than in male headed households.

Table 4.9. Education level of household head (female and male)

	Female		Male	
	Frequency	Percent	Frequency	Percent
Cannot read and write	28	15.2	32	17.4
Std 8 and below	91	49.5	70	38.0
Form 1-4	42	22.8	43	23.4
Form 5-6	0	0	9	4.9
College and above	7	3.8	21	11.4
Missing	16	8.7	9	4.9
Total	184	100.0	184	100.0

Source: Author’s compilation

Table 4.10 presents the sugarcane production labour distribution by gender and shows that cultivation was equally done by both men and women (46.7%), while about half (50.1%) of the respondents stated that cultivation was mainly done by men. The respondents who stated that this job was mainly done by women were 1.6% while 1.6% did not respond. Cultivation was being done mainly by oxen plough, which was labour demanding and thus was dominated by men, as found during focus group discussions.

On planting of sugarcane, the majority of the respondents (51.2%) stated that this was done equally by both men and women, 44% stated that this was mainly done

by men, and 3.2% stated that it was done by women while 1.6% did not respond to the question. This shows that planting of sugarcane was mainly done by both men and women, but dominated by men.

Fertilizer application was done by both men and women equally, as shown by the majority of the respondents (57.1%), while 39.1% of the respondents stated that this was mainly done by men, and 2.2% stated that this was mainly done by women. It can therefore be stated that men and women were equally involved in fertilizer application.

Table 4.10 shows that weeding was equally done by both men and women (63%) while 34.3% stated that this was mainly a men’s job, with 1.1% stating that it was mainly a women’s job. This shows that weeding was equally done by men and women. Weeding of sugarcane was done by women using a hoe, while the men more often carried out the weeding by oxen, as found out during focus group discussions.

Table 4.10. Sugarcane production labour distribution by gender

	A	B	C	D	E	F
Men only	50.1	44	39.1	34.3	64.1	22.2
Men and women	46.7	51.2	57.1	63	28.3	12
Women only	1.6	3.2	2.2	1.1	3.8	1.6
Not done	0	0	0	0	0	61.7
Missing	1.6	1.6	1.6	1.6	3.8	2.5
Total	100	100	100	100	100	100

Key:

A= Cultivation

C= Fertilizer application

E= Harvesting

B= Planting sugarcane

D= Weeding

F= Book keeping

Source: Author’s compilation

Harvesting was stated to be a men’s only job by 64.1% of the respondents, but 28.3% said that this is done equally by men and women. About 3.8% were of the opinion that this was a women’s only job and 3.8% did not respond to the query.

The farmers indicated during focus group discussions that cane harvesting was mainly a men's activity because it was labour intensive.

Results in Table 4.10 show that book keeping was practised by only 35.8% of the respondents, while the majority of the respondents (61.7%) did not do any book keeping. However, it was found that book keeping records were mainly limited to cane delivery records and no tangible book keeping records were undertaken by the farmers.

Table 4.11 presents the percentage of respondents that carried out field soil sampling and shows that the majority of the respondents (90.2%) stated that there was no field soil sampling carried out, while 5.4% stated that there had been some field soil sampling. About 4.3% did not respond to this question. During focus group discussions, the farmers indicated that the few who carried out soil sampling sought the services from the Ministry of Agriculture extension officers. Without soil sampling and analysis it would be difficult to assess the right types of fertilizers to be applied in sugarcane production.

Table 4.11 Field soil sampling and testing for fertility

	Frequency	Percent
Yes	10	5.4
No	166	90.2
Missing	8	4.3
Total	184	100.0

Source: Author's compilation

Table 4.12 presents the results on whether fertilizer application was based on soil sampling and tests.

Table 4.12. Fertilizer application and whether based on soil sample tests

	Frequency	Percent
Yes	13	7.1
No	158	85.9
Missing	13	7.1
Total	184	100.0

Source: Author's compilation

Table 4.12 shows that the majority of the respondents (85.9%) did not base their fertilizer application on the testing of soil samples. Only about 7.1% of the respondents based the application of fertilizers on soil sampling and tests.

Table 4.13 presents the livestock ownership of the respondents and shows that the majority of the respondents (51.6%) kept livestock, while 41.3% did not keep livestock. The farmers indicated that the livestock they kept were mainly oxen for land cultivation, sheep, goats and local chicken.

Table 4.13 Livestock ownership

	Frequency	Percent
Own livestock	95	51.6
Does not own livestock	76	41.3
Missing	13	7.1
Total	184	100.0

Source: Author's compilation

Table 4.14 presents results on the sources of financing of farm operations of the respondents. The table shows that 47.8% of the respondents used their own savings, 12.5% used funds borrowed from the family members and 10.9% used proceeds from a business.

Table 4.14. Sources of financing farm operations

	Frequency	Percent
Savings	88	47.8
Government grant	2	1.1
Sales of assets	12	6.5
Sales of a business	20	10.9
Pensions	4	2.2
Personal borrowing from the family	23	12.5
Informal money lender	12	6.5
Insurance policy	2	1.1
Missing	20	10.9
Total	184	100.0

Source: Author's compilation

Further, 6.5% of the respondents used proceeds from the sale of assets while 6.5% used funds borrowed from informal money lenders. About 2.2% used Pensions as the source of finances. Equal percentages of 1.1% were for those who used Government grants and Insurance policies respectively. About 10.9% of the respondents did not respond to the question.

Table 4.15 presents the respondents' average annual income from sugarcane. The table shows that about half (47.3%) of the respondents earned an average annual income of Ksh. 20,000 shillings and below; 25.5% earned between Ksh. 21,000-100,00 while only about 14.1% earned an average annual income above Ksh. 100,000 shillings from sugarcane.

Table 4.15. Income from sugarcane

	Frequency	Percent
20,000 and below	87	47.3
21,000 – 100,000	47	25.5
above 100,000	26	14.1
Missing	24	13.0
Total	184	100.0

Source: Author's compilation

Table 4.16 presents whether the respondents had off-farm income or not. The table shows that majority (79.9%) had no off-farm income, while 15.8% had some off-farm income. The remaining 4.3% did not respond to the question. This implies that the majority of the respondents relied on income from the farm.

Table 4.16. Off-farm income

	Frequency	Percent
Has off-farm income	29	15.8
Has no off-farm income	147	79.9
Missing	7	4.3
Total	184	100.0

Source: Author's compilation

Table 4.17 presents the sugarcane farmer's attitude towards taking risks. The study found that 53.3% of the farmers were willing to take risks in farming, 30.4% were not willing to take risks, and 13% were indifferent. About 3.3% did not respond to the question.

Table 4.17. Willingness to take risks

	Frequency	Percent
Willing	98	53.3
Indifferent	24	13.0
Not Willing	56	30.4
No response	6	3.3
Total	184	100.0

Source: Author's compilation

Table 4.18 presents the respondents' channels of information communication on agriculture and shows that the majority (51.1%) of the respondents received agricultural information through the village meetings, while 27.1% received it through the radio channel, 5.4 % through the press and 2.2% through the internet. About 5.4% did not respond to the question.

Table 4.18. Channels of information Communication on agriculture

	Frequency	Percent
Village Meetings	94	51.1
Radio Channels	50	27.1
Television Channels	16	8.7
The Press	10	5.4
Internet	4	2.2
Non Response	10	5.4
Total	184	100.0

Source: Author's compilation

Further analysis of the sources of agricultural information showed that SONY Sugar Company, locally elected leaders, agricultural input supply firms family

members, government agencies, non-governmental organizations (NGOs) and other cane growers were important sources of information (See Table 4.19).

Table 4.19. Source of information on sugarcane production

	Frequency	Percent
SONY Sugar Company	51	27.7
Locally Elected Leaders	34	18.5
Agricultural Input Supply Firms	31	16.8
Family members	22	12.0
Government Agencies	1	0.5
NGOs	1	0.5
Other Cane Growers	1	0.5
Non Response	43	23.5
Total	184	100.0

Source: Author's compilation

Table 4.19 shows that those who regarded SONY Sugar Company as the most important source of information on sugarcane production were 27.7%, while 18.5% regarded elected leaders to be the most important source of information on sugarcane production and 16.8% regarded agricultural input supply firms as the most important source of information on sugarcane production. The rest regarded family members (12%), government Agencies (0.5%), NGOs (0.5%), and other sugarcane growers (0.5%) as the their most important source of information on sugarcane production. This reveals that the farmers receive information on sugarcane production mostly from the contracting company, followed by locally elected leaders and agricultural input supply firms.

Table 4.20 presents results on whether the respondent had received any specialized technical training from SONY Sugar Company. The majority (70.7%) had not received any and only 15.8% of the interviewed respondents had been offered some specialized technical training by SONY Sugar Company.

Figure 4.1 presents the sugarcane marketing channels during the last 5 years preceding the study and shows that the sugarcane is marketed mostly through the contractor, i.e. SONY Sugar Company, Syndicate traders (where traders from outside the district have formed an association to engage in buying sugarcane

Table 4.20. Whether technical training had been offered by SONY Sugar Company

	Frequency	Percent
Had Technical training from SONY Sugar Company	29	15.8
No Technical training from SONY Sugar Company	130	70.7
Non response	25	13.6
Total	184	100.0

Source: Author's compilation

and selling to factories outside the district, most commonly to Kibos Sugar Factory), brokers who buy contracted and non-contracted sugarcane and sell to SONY Sugar Company, and finally through the spot market, where traders buy sugarcane for jaggery processing.

From the study findings, over 50% of the farmers marketed their sugarcane harvest through SONY Sugar Company. However, it was noted that the percentage of the growers marketing their sugarcane directly to SONY Sugar Company has been declining from 68.4% in 2006-2007 to 50% in 2010-11,

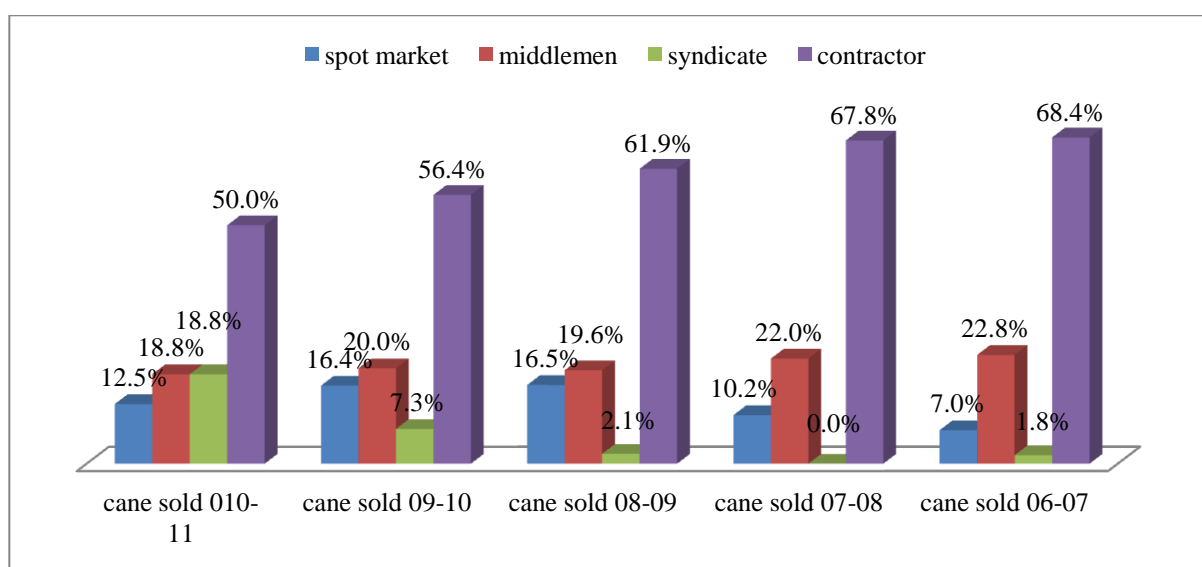


Figure 4.1 Sugarcane marketing channels

whereas that for those who marketed through the syndicate traders generally rose from 1.8% to 18.8% during the same period. The spot market trading rose from 7.0% in 2006-2007 to 12.5% in 2010-2011. The middlemen more or less maintained their percentage, averaging about 20.6%.

From the focus group discussions, the farmers indicated that they would sell their contracted sugarcane to syndicate traders whenever the contractor delayed in harvesting their produce. The same is true for the spot market where the farmers found a ready outlet for their produce when needed. However, it was also noted that even the middlemen would buy sugarcane from the contracted farmers at a lower price and then deliver and sell it to the contractor, whenever there was a delay in harvesting.

Figure 4.2 presents the results on harvester of the respondent's sugarcane and shows that 38.6% of the respondents were offered harvesting services by the contractor, i.e. the SONY Sugar Company. The figure also shows that 19.6% was harvested by middlemen, while 14.7% and 12% were harvested by the syndicate traders and self respectively. About 15.2% of the respondents did not answer the question. The results show that the SONY Sugar Company still constitutes the greatest harvester of the farmer's sugarcane.

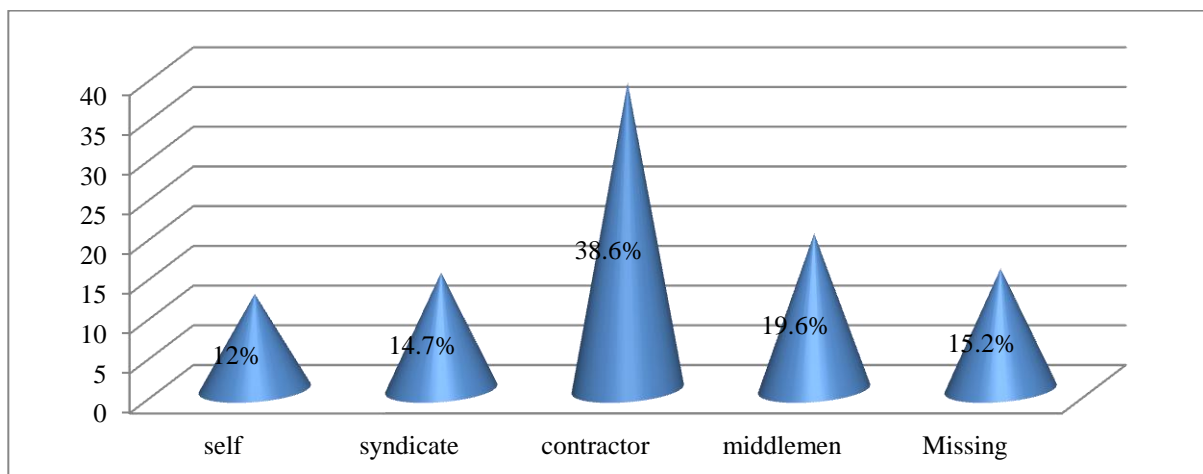


Figure 4.2 Sugarcane harvesters

The recommended duration for the plant crop before it is harvested is 24 months or less. Table 4.21 presents the actual duration taken for the sugarcane (plant

crop) to be harvested. The respondents who had their sugarcane harvested by SONY Sugar Company in 24 months or less were 57.1%, while 39.7% was harvested in above 24 months. About 1.1% of the respondents could not remember how long it took before their sugarcane was harvested and 4% of the respondents did not answer the question.

Table 4.21. Planting to harvest period (plant crop)

Months	Frequency	Percent
24 or less	105	57.1
>24	73	39.7
Unknown	2	1.1
Non response	4	2.2
Total	184	100.0

Source: Author's compilation

The shorter the duration (hours) of the time taken to deliver the sugarcane to the factory after harvesting the better. Table 4.22 presents the duration (hours) taken after harvest for the produce to reach the factory and shows that 52.7% of the respondents' sugarcane took less than 24 hours between the farm and the factory, while 34.2% of the respondents said that it took between 24 and 60 hrs, and 0.5% said it took more than 60 hours. About 12.5% did not know how long it took.

Table 4.22. Farm to factory duration (hrs)

Hrs	Frequency	Percent
<24	97	52.7
24-60	63	34.2
Over 60	1	0.5
Unknown	23	12.5
Total	184	100.0

Source: Author's compilation

Quite a substantial amount of sugarcane was lost by the farmers due to weight loss between the farm and the factory. Figure 4.3 presents the level of loss of sugarcane weight after harvest as perceived by the respondents. About 44.6% of

the respondents were of the opinion that the loss of sugarcane weight outside the mill was significant, while 27.2% considered the loss insignificant. About 6% had not noted any loss of sugarcane as a result of being outside the mill, while 22.3% did not answer the question.

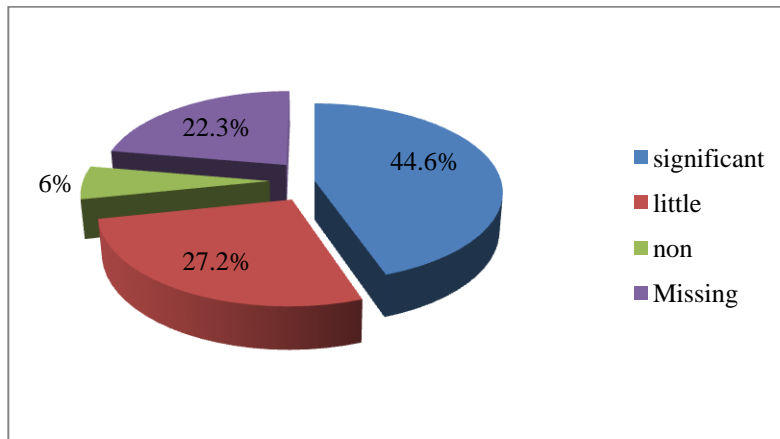


Figure 4.3 Farmer perceptions on weight loss of sugarcane outside mill

Figure 4.4 presents the mode of payment for sugarcane delivered by the farmers. According to Figure 4.4, 54.3% were paid through cheque, 37.5% were paid in cash, while 8.2% of respondents treated this as confidential and thus did not respond to the question.

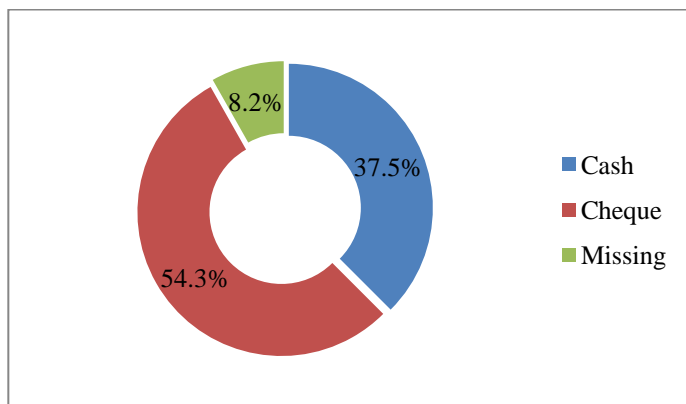


Figure 4.4 Farmer mode of payment for sugarcane

Table 4.23 presents the percentage of growers interested in expanding their sugarcane production. Table 4.23 shows that 57.1% were interested in expanding their sugarcane production while 38% were not interested in expanding their sugarcane production. Only 4.9% of the respondents were reluctant to answer this question.

Table 4.23. Interest in expansion of sugarcane production

	Frequency	Percent
Interested in sugarcane expansion	105	57.1
Not interested in sugarcane production	70	38
Missing	9	4.9
Total	184	100.0

Source: Author's compilation

Table 4.24 presents the reason for not being interested in expanding sugarcane production. Table 4.24 shows that 25% were not interested in expanding sugarcane production due to land shortage, while 6.5% indicated that the marketing problem was their reason of having no interest in expanding sugarcane production. About 1.9% of the respondents indicated that the labour problem was their major reason of losing interest in expanding sugarcane production.

Table 4.24. Reason for non-interest in expansion of sugarcane production

	Frequency	Percent
Land shortage	46	25.0
Labour problem	3	1.9
Marketing problems	12	6.5
Not profitable	10	5.4
Not sure	113	61.4
Total	184	100.0

Source: Author's compilation

Figure 4.5 presents the farmers' perception on sugarcane productivity compared to other farm enterprises. The majority (62%) were of the opinion that sugarcane

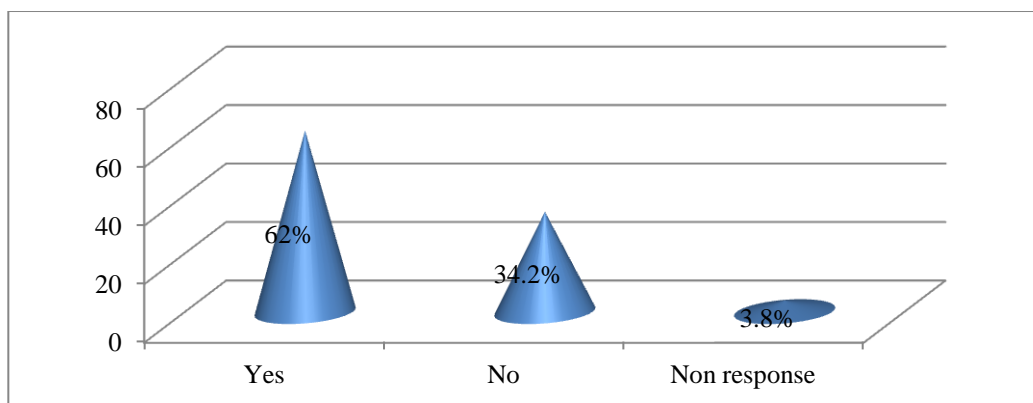


Figure 4.5 Response on sugarcane productivity compared to other farm enterprises

was more productive than any other farming enterprise in the area, while 34.2% were of the opinion that sugarcane was not. About 3.8% did not answer this question.

Table 4.25 presents the respondents' perception on income status in the last 5 years prior to the study. Table 4.25 shows that 43.5% of the respondents felt that their income had remained more or less the same compared to 5 years prior to the study, while 29.3% felt that their income was better, and 20.1% felt that their income was worse.

Table 4.25. Farmer's perception on income status in the last 5 years

	Frequency	Percent
Farm income has become better	54	29.3
Farm income has become worse	37	20.1
Farm income has remained the same	80	43.5
Non response	13	7.1
Total	184	100.0

Source: Author's compilation

4.4 Results of comparing key socio-economic characteristics of contract and non-contract farmers

In this subsection, we test the first hypothesis (H1), which states that household and institutional characteristics have no significant influence on participation in the SONY Sugarcane contract farming scheme. We also test the second hypothesis (H2), which states that there is no significant difference in household and agricultural assets between contract and non-contract farmers.

4.3.1 Comparison of characteristics of Contract and Non-Contract farmers

In the first stage, the study analysed whether participation in the SONY contract scheme has a positive impact on the household welfare of the growers by comparing the mean of characteristics of contract farmers and non-contract farmers using a t-test. A subset of five welfare indicators and twelve other socio-economic characteristics were retained from the preceding descriptive statistics

as presented above for subsequent analysis to compare characteristics of participants in SONY contract scheme and non-participants. The welfare indicators were landholding (total farm area), value of agricultural assets, value of the respondent's house, duration of hunger season, sugarcane household income, and per cent average annual turnover contributed by sugarcane. Table 4.26 presents a comparison of the mean values of key demographic profiles and personal characteristics of contracted and non-contracted sugarcane growers for the variables retained for the analysis and the result of a t-test of the differences between the variables. The results show that participants in SONY Contract scheme and non-participants differed significantly along four of the five welfare indicators that had been retained for subsequent analysis. From the results, the growers who participated in the SONY contract scheme had a significantly higher landholdings ($p=0.022$), higher value of their houses ($p=0.021$), higher percentage of annual turnover contributed by sugarcane ($p=0.027$), and higher income ($p=0.024$). Surprisingly, the contracted growers had a significantly higher duration of hunger period than the non-contracted farmers.

From focus group discussions and in-depth interviews the farmers indicated that the sugarcane income came once in about 2 years, which they were not able to save for food until the next harvest and payment. Since their land was occupied with sugarcane, the long term contract agreement constrained them from diversifying into other food crops. Therefore, participating farmers are better off and statistically significant on the proxy indicators for welfare, except for the duration of the periods of hunger.

The Company sector office plays an important role in recruiting farmers and therefore the closer the farm to the Company sector office, the higher the chances of being contracted by SONY Sugar Company. The average distance of farms from the SONY Sugar Company sector office was 6.0 km. The average distance for non-contract farmers was 7.4 Km and the average distance for contract farmers was 5.2 km., significant at 0.1 % ($p= 0.001$). Other significant differences were also noted between contracted and non contracted sugarcane growers at 5%, 1% and 0.01 % levels as shown in Table 4.26. Contracted growers had a significantly larger household size ($p= 0.011$), more dependant males in the active

age category of 15-65 years ($p=0.008$), more land under other enterprises by 145% ($p=0.050$), and more experience in agriculture ($p= 0.020$). However, contracted growers had a significantly longer time schedule before payments are received than non-contracted growers ($p=0.001$).

Table 4.26 Characteristics of SONY contract and non-contract farmers

Variable	Non-contract Farmers (n=69)	SONY Contract Farmers (n=115)	t-Stat.	Sign	All farmers (N=184)
<i>Farmer characteristics</i>					
Age of household head(years)	42	38	0.17	0.108	40
Farm distance from Company sector office (km)	7.4	5.2	4.022	0.001***	6.0
Size of household (total no.)	6.1	7.9	-2.556	0.011*	7.3
Number of dependant living in household (females 15- 65 yrs)	1.4	1.9	-1.707	0.090	1.7
Number of dependant living in household (males 15- 65 yrs)	1.3	2.0	- 2.699	0.008**	1.8
<i>Land, agriculture and production management information</i>					
Experience in agriculture(yrs)	3.3	6.0	-2.351	0.020*	5.1
Sugarcane area cultivated (ha)	1.6	2.3	-1.563	0.120	2.1
Land area other enterprises (ha)	0.1	0.3	-1.975	0.050*	0.2
Land assigned to sugarcane in 2010/2011(ha)	0.3	0.5	-0.606	0.546	0.4
Land assigned to sugarcane 5 yrs ago (ha)	1.8	2.5	-1.595	0.113	2.3
Land assigned to sugarcane 10 yrs ago (ha)	0.6	0.7	-0.419	0.675	0.6

Household welfare and financial characteristics

Landholding (Total area of farm in ha)	3.3	4.8	-2.302	0.022*	4.3
Value of agricultural assets (Ksh) ^a	2146	2622	-1.234	0.173	2384
Value of house (Ksh)	21652	32934	-2.201	0.021*	27304
Duration of hungry season ^b	3.270	3.621	4.230	0.001***	3.4
Sugarcane Income (Ksh)	203739.8	298751.0	-0.877	0.012*	244368
Amount spent on sugarcane agricultural inputs (fertilizer)	10165.2	14476.1	-1.313	0.191	13162
% average annual turnover contributed by sugarcane	50.0	61.5	-2.238	0.027*	57.9
Payment schedule by miller(no. of weeks)	2.0	4.3	-6.774	0.001***	3.6

*Significant at 5%, **Significant at 1%, ***Significant at 0.1%

(a) Based on purchase price and straight-line depreciation assumption

(b) Based on period when one or more household member unwillingly eats less than three meals a day due to lack of food.

Source: Author's compilation

4.3.2 Econometric analysis of participation

The differences between the farmers participating in the SONY contract and those non-participating were considered important when evaluating whether participation in the contract is correlated with household wealth as a welfare variable. This section presents the estimation results for the choice between participation in the SONY contract scheme and non-participation in Table 4.27.

The probit model estimates as presented in Table 4.27 shows the probability that a given household will participate in the SONY contract farming scheme given the various attributes, i.e. the explanatory variables in the model. Ten attributes from the probit model were found to be significant, corroborating the descriptive

analysis. The description of the significant explanatory variables with expected signs and unit of measurement are as follows:-

Risks: The respondents who were highly likely to take risks in farming ($p=0.02$) were 62% less likely to participate in the SONY contract scheme. The converse is true that risk-averse farmers were highly likely to participate in contract farming.

Table 4.27. Probit model of participation in SONY contract scheme

Parameter	Est.	S. E.	Sig.
<i>Dependent variable: Contract participation dummy</i>			
Gender	0.28	0.37	0.45
Age of household head (years)	- 0.06	0.14	0.68
Willingness to take risks	-0.62	0.26	0.02*
Production finance from financial institution	-1.77	0.77	0.02*
Farm record keeping	- 0.50	0.50	0.32
Household size (person)	0.13	0.05	0.01**
External farm input support	-1.06	0.21	0.001***
Education of household head (years)	-1.47	0.55	0.01**
Value of agricultural assets (Ksh) ^a	-1.91	0.51	0.001***
Value of house (Ksh)	-0.63	0.27	0.02**
Total farm area (ha)	0.09	0.05	0.05*
Sector office (km)	-0.11	0.06	0.04*
Intercept	15.0	3.1	0.001***
N= 184	% correct predictions = 97%		P-value>F 0.001
		Predicted	Total
		0	1
Actual	0	66	3
	1	3	112
No. of observations		69	115
			184

*Significant at 5%, **Significant at 1%, *** Significant at 0.1%.

(a) Based on purchase price and straight-line depreciation assumption

Source: Authors compilation

The variable was hypothesised to have a negative impact on the probability of participating in the contract scheme. This is supported by literature: one of the main reasons why farmers engage in contract farming is to cope effectively with risks associated with agricultural enterprises (Hardaker, Huirne, Anderson, and Lien, 2007). Contract farming is viewed as a means of hedging against risks, and risk-averse farmers would tend to participate in marketing arrangements that reduce risks, such as futures markets (Wainaina, Okello, and Nzuma, 2012).

Indicators of welfare: Contrary to expectation, all the indicators of welfare showed a significant negative relationship with participation. The expectation was that the greater the indicators of the value of the welfare such as agricultural equipment, the greater the probability that the farmer participates in the contract scheme. However, the respondents who had a higher value of agricultural assets ($p=0.001$), had a higher house value ($p=0.02$), received more external farm input support ($p=0.001$), and received more production finance support ($p=0.02$) were less likely to participate in SONY Contract farming. This implies that with more resources, the SONY contract credit becomes less attractive, and the farmers opted for alternative sources, rather than contract to receive credit. This is supported by literature that, farmers with more indicators of welfare have higher credit rating and thus attract higher loans to increase their productivity (Warning and Key, 2002). During focus group discussions, the farmers' perception was that the SONY credit terms were expensive. Fertilizer was singled out as the most affected. The fertilizers were provided on credit for the contract farmers, but only for those who chose to ask for them. The data provided by the SONY employees indicated that fertilizer usage was declining from a high of 24,141 bags of DAP and 12,313 bags of UREA in 1995/1996 period to 4,632 bags of DAP and 4,795 bags of UREA in 2010/11 period. This was against the Company target for 2010/11 period of 22,703 bags of DAP and 31,374 bags of UREA (see Appendix.3 subsection 2). This factor could be the reason for the declining sugarcane output over the same period, from 129.9 tch yield in 1996/97 period to 73.86 tch yield in 2011/2012 (see Appendix.3 subsection 4). This proposition is supported by the fact that inadequate application of fertilizer (below 60kg P₂O₅ ha⁻¹

¹ and 100kg N ha⁻¹ for plant crop and 120kg N ha⁻¹ for ratoon crops) lowers sugarcane yield and thus sugarcane productivity (KESREF, 2013).

Land size: An increase in one hectare of land was likely to raise participation in contract farming by 9%. As expected, land is a very important determinant in recruiting farmers to participate in the scheme, and there is a minimum set acreage for one to be recruited into the farming scheme. Therefore, smaller farms are likely to be excluded. Furthermore, the literature shows that larger farms tend to benefit more from the contract in terms of credit disbursement (Chang, Chen, Chin, and Tseng, 2006).

Distance: As expected, distance to the sector office was an important determinant of participation in the SONY contract scheme. The local company sector office plays a crucial role in searching and selecting farmers to join the contract scheme. For every additional kilometre of distance to the sector office, the probability of the respondents participating in the SONY contract scheme ($p=0.04$) was likely to decline by 11%. This suggests that the growers were sensitive to transaction costs. This is supported by the literature which shows that reduced transaction costs increase the likelihood of farmers to participate in markets (Ouma, Jagwe, Obare, and Abele, 2009).

Household size: As expected, family size increase by an additional member ($p=0.01$) was likely to increase the probability of the growers participating in the contract scheme by 13%. Sugarcane cultivation in Kenya is a labour intensive enterprise. Strict guidelines on the weeding regimes for sugarcane cultivation must be followed. The high labour demand is particularly required during planting, weeding and harvesting. Thus availability of on-farm family labour would highly determine the probability of participation in the contract scheme. Larger households would be more likely to receive a contract. The study finding is supported by other studies on contract farming where labour intensive cultivation is required (Warning and Key, 2002).

Education of household head: This study found that the Household Heads ($p=0.01$), who received more education were 147% less likely to participate in the

contract scheme. In this study, the variable had been hypothesized to have a positive impact on the probability of participating in the contract scheme. This was supported by literature which indicates that education facilitates skills acquisition which enables households to have access to non-farm income, thus lowering the probability of participating in markets (Ouma, Jagwe, Obare, and Abele, 2009). The expectation was that more educated farmers are likely to be better endowed with resources from alternative sources of income and therefore are less likely to participate in the contract scheme for the purposes of obtaining credit.

The study thus concludes that the factors that significantly influence participation in sugarcane contract farming with participation in contract farming as the dependant variable (see Table 4.27) are:- (i) Household size, (ii) external farm input support, (iii) education of the Household head, (iv) value of agricultural assets, (v) value of the household heads house, (vi) total area of the land farmed, and (vii) the distance of the farm from the sector office. Based on the findings from participatory research techniques (PRTs), the study also established that those who participated in contract farming were not necessarily better off than non-participants. This finding is also supported by econometric modelling where the coefficient of “welfare indicators” was found to be negative.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter first summarizes the findings of characterising SONY Sugar company contract scheme, then the findings of the factors associated with participation in SONY contract farming scheme and finally the findings of the impact of contract farming on household wealth. At the end of the chapter the study makes recommendations.

5.1 Summary of the Findings and Conclusion

The study sought to characterize the nature of SONY Sugar Company contract scheme. The study found that the SONY contracted sugarcane farmers experienced a number of problems, including high transaction costs arising from poor contract terms and conditions. The farmers coped with some of these problems by “side-selling” their sugarcane to SONY Sugar Company competitors. Although the study did not go further to measure the actual transaction costs involved, it did shed some light on the nature and forms of transaction costs involved.

On the issue of socio-economic characteristics of the respondents, the majority were in the productive age of 30 years and above (77.1%) and had lived in the SONY Scheme area for more than 20 years (89.1%). Therefore, it can be concluded from the demographic profile that the respondents were mature, had lived in the area long enough to be able to make rational decisions about sugarcane farming, and provide dependable information. Although sugarcane production was supposed to have improved the standard of living of the growers, the majority (80.4%) were still living in semi-permanent houses. Furthermore, the education level was found to be quite low, with 38% of the male Household Heads and 49.5% of the female Household Heads having attained their highest level of education as standard 8 and below.

On the production factors, 90.2% of the growers were not carrying out any field soil sampling and testing for fertility, while 85.9% were not applying the recommended amount of fertilizer based on field soil sampling and testing for

fertility. Furthermore, during focus group discussions with 30 farmers, the growers stated that they used to be given fertilizers and credit uniformly, but over the years, fertilizer was only issued as demanded by the farmers. Due to the high cost, the growers either do not demand for the fertilizers from the miller or demand lower quantities than apply lower than the recommended rates (see Appendix.3). Inadequate application of fertilizer (below 60kg P₂O₅ ha⁻¹ and 100kg N ha⁻¹ for plant crop and 120kg N ha⁻¹ for ratoon crops) lowers sugarcane yield and thus sugarcane production (KESREF, 2013). Other findings were on farm record keeping where the majority (61.7%) were not keeping farm records. Farm record keeping is an important tool in proper farm management.

The study also found that the majority (70.7%) had not been offered any technical training by SONY Sugar Company, yet they needed it. On how the farmers received agricultural information, village meetings (51.1%) still remained the most important channel to convey agricultural information. Therefore, it can be concluded that the farmers do not receive adequate knowledge about modern farming methods to increase their production.

On post-harvest handling and marketing, the study found that the percentage of growers channelling their produce directly to the miller had been declining from 68.4% in 2006-2007 to 50% in 2010-11. Whereas sugarcane marketing through the syndicate traders had generally been rising from 1.8% to 18.8% and spot market trading had been rising from 7% in 2006-2007 to 12.5 % in 2010-2011. However, an average of 20.6% of the growers marketed their produce through middlemen during the period. On weight loss outside the mill, 44.6% of the growers considered sugarcane weight loss outside the mill to be quite significant. About 63.6% of the farmers considered their income to have remained either the same or decreased in the last 5 years prior to the study. The rise in marketing through syndicate traders, spot market trading and middlemen was due to the opening up of other more lucrative marketing channels. During informal interviews, it was found that the syndicate traders were ferrying the sugarcane to Kibos for milling, more than 170Km from the SONY Sugar zone.

On annual average earnings from sugarcane, nearly a half (47.3%) earned Ksh 20,000 and below annually, while only 14.1% earned an average income of over Ksh. 100,000 annually. With regard to the farmer's perception on income status in the last 5 years prior to the study the majority (72.8%) considered their income to have either remained the same or increased due to sugarcane farming. This implies that the majority of the farmers still consider sugarcane farming as a worthwhile enterprise.

On comparative analyses of contract and non-contract sugarcane farmers, the analyses revealed that contract farmers had more total farm land (by 47%), more land under other enterprises (by 147%), higher household size (by 29%), higher percentage average sugarcane annual turnover (by 23%), and more experience in agriculture (by 86%). Contracted sugarcane farms were closer to the SONY Sugar Company sector office than non contracted farms and had longer payment schedule than non-contracted sugarcane farms. However, the contracted growers faced a longer duration of hungry season than their non-contracted growers. The contracted farmers indicated that the income came once in about 2 years, which they were not able to save for food until the next sugarcane harvest and payment. This was unlike their non-contracted growers who had more land under food crops to supply the family needs. This is a significant feature from food security perspective.

On the factors influencing grower's participation in the contract scheme, the study found that the company sector office played a crucial role in recruiting growers to participate in the contract scheme. However, growers who were better endowed with owning agricultural assets, better housing, had external sources of farm inputs and production finance support opted not to contract with the company for the purposes of obtaining credit. The study found that the credit terms were less attractive and preferred not to contract with SONY Sugar Company for the purposes of obtaining credit where farmers had better options. The other factors influencing farmer participation in the sugarcane contract scheme were:- (i) risk averse farmers who were likely to participate in contract farming due to risks associated with farming, (ii) farmers with large farms who were likely to be recruited into the scheme by the company, (iii) larger Households due to

availability of on-farm family labour for sugarcane cultivation, and (iv) more educated Household Heads were less likely to participate because they had access to non-farm income.

Participatory research methods revealed that contracted farmers were not necessarily better-off than non-contracted farmers from the welfare perspectives. The contracted farmers claimed that they experienced higher post-harvest sugarcane losses because weighing was done at the reception area of the sugar company factory (rather than at the farm gate).

In conclusion, it is observed that the contracted growers were experiencing a number of problems, including higher transaction costs which eroded their profit gains. Some of the problems were in-built in the SONY contract terms and conditions. Furthermore, the sugarcane contract scheme in its current form was not lucrative enough to encourage farmers to participate in the scheme. The contract terms and conditions can be addressed by the government and the contracting companies to encourage contract participation and increase the area under contract sugarcane production. It was also found that the long term contract on sugarcane supply agreement constrained the growers from diversifying into food crops. Therefore, the contracted farmers faced a longer season of hunger than their non-contracted growers.

5.2 Recommendation

Given the potential benefits of functional and well-structured contract farming schemes, and to encourage the farmers to remain in the contract scheme and also encourage others to join the scheme, the farmers' concerns on high cost of administering the contract need to be addressed. This would increase the delivery of sugarcane to the factory by Out-growers and increase sugar production by the SONY Sugar Company. Policies and strategies to encourage contract participation and expand the area under sugarcane, while making sugarcane production more competitive, should include the following:- (i) provide better lending terms for farm inputs provided on credit to farmers particularly, fertilizers to encourage application and use; (ii) incorporate soil sampling and testing costs in the production credit extended to the farmers; (ii) providing periodic sugarcane

technical training to increase production; (iii) weighing of the sugarcane at the farm gate, to prevent postharvest losses; (iv) review contract terms and conditions with the objective of making them attractive; and (v) pay sugarcane delivery based on quality (sucrose content) as recommended in the sugar act.

The study also recommends that, in future, research could be undertaken to evaluate the transaction cost points which this study was not able to accomplish due to limitations of time and funding.

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APPENDICES

Appendix.1: List of documents consulted

1. Received from Divisional Agricultural Offices

- Migori = PRA reports
- Uriri = PRA reports
- Awendo = PRA reports
- Rongo = PRA reports

2. Received from KSB

- Yearbook of Sugar Statistics 2010, 100 pages
- Kenya Sugar Industry Strategy Plan 2010-2014: Enhancing Industry Competitiveness, 74 pages
- Kenya Sugar Board Strategic Plan, 2009-2014, 61 pages
- The Kenya Sugar Industry Value Chain Analysis: Analysis of the production and marketing costs for sugarcane and sugar related products. Draft Report May 2010. 82 pages.

3. Received from KESREF

- A newsletter of the Kenya Sugar Research Foundation: KESREF Digest;
 - Vol. 4 Issue 1; July-September, 2009
 - Vol. 5 Issue 2 - 2011
 - Vol. 5 Issue 3, March 2011
 - Vol. 5 Issue 4 June 2011
- Kenya Sugar Research Foundation (KESREF) Report 104 pages

4. Received from MENR/ NEMA

- District Environment Action Plan (DEAP) 2009-2013.
 - DEAP 2009-2013, Kuria, 60 pages
 - DEAP 2009-2013, Migori, 53 pages.

Appendix.2: 10 year sugarcane hactarage, and production

Year	Area Harvested (ha)	Production (tons)
2011	64091	5338560
2010	68738	5709590
2009	65774	5610700
2008	54465	5112000
2007	59201	5204210
2006	54621	4932840
2005	56537	4800820
2004	54191	4661000
2003	50468	4204060
2002	54010	4501360
2001	47794	3550790
2000	57243	3941520
1999	51833	4415780
1998	50111	4661360
1997	56000	4450000
1996	57000	4650000
1995	56145	4550000
1994	57392	3800000
1993	51943	4370000

Source: (FAO, 2013)

Appendix.3: Data obtained from key informants from SONY Sugar Company

The following information was provided by SONY Sugar Company Key informants at the level of Company assistant planning officers

1. Sugarcane delivery (TC.) 1995/1996 to 2011/2012

Period	Out-growers		Non contracted		Total	
	Actual	Target	Actual	Target	Actual	Target
1995/96	532950	474243	34824	33392	690196	599960
1996/97	496298	479348	26744	17546	621538	600000
1997/98	544260	560000	33671	20000	704732	700000
1998/99	603646	583000	45133	20118	742609	708118
1999/00	490361	629000	14646	20000	598354	733000
2000/01	231881	566000	32039	20000	342694	680000
2001/02	427030	379200	52471	25000	602065	513460
2002/03	312531	500195	106160	54205	511196	660000
2003/04	493463	498416	90464	88177	677459	666800
2004/05	549769	607330	125084	111115	767966	803000
2005/06	516062	710000	109318	100000	729926	910000
2006/07	484477	700000	62426	100000	655801	900000
2007/08	446087	600000	66629	50000	628192	750000
2008/09	425786	600000	78517	50000	587052	750000
2009/10	408700	650000	76774	20000	558260	750000
2010/11	516399	650000	96825	20000	725014	750000
2011/12	464754	651600	81338	20000	640465	760000

2. Out-growers fertilizer usage 1995/1996 to 2010/2011(Bags)

Period	DAP		UREA	
	actual	target	actual	target
1995/96	24141		12313	
1996/97	14921		12272	
1997/98	7416		4777	
1998/99	2935		4826	
1999/00	8728		6822	

2000/01	7436	30000	8184	30000
2001/02	4475	14847	4319	15119
2002/03	11793	23095	18196	36759
2003/04	13465	24596	15483	48890
2004/05	12375	43086	14766	56358
2005/06	9961	40794	16190	62191
2006/07	6843	23817	5608	29089
2007/08	4063	22812	1449	32310
2008/09	683	16271	206	25632
2009/10	3239	16402	4044	23049
2010/11	4632	22703	4795	31374

3. Sugarcane position (Ha) 1995/1996 to 2011/2012

Period	N/estate	Out-growers	Total	Target
1995/96	2281	15010	17291	
1996/97	2302	15089	17391	
1997/98	2254	15232	17485	
1998/99	2215	12832	15047	
1999/00	1975	10195	12170	
2000/01	2182	10010	12192	17200
2001/02	2271	9870	12141	17200
2002/03	2328	13336	15664	17200
2003/04	2208	17226	19434	17200
2004/05	2230	19897	22127	22400
2005/06	2344	20871	23215	22409
2006/07	2353	19311	21664	22409
2007/08	2340	17043	19383	22409
2008/09	2239	15530	17769	18300
2009/10	2307	14975	17282	18300
2010/11	2223	14813	17036	19300
2011/12	2121	14776	16898	18300

4. Out-growers sugarcane productivities yields (tch)

Period	Harvested	Productivity
	Ha	Yields (tch)
1995/96	4769	106.5
1996/97	3547	129.9
1997/98	4645	114.6
1998/99	5394	110.1
1999/00	5392	88.9
2000/01	4587	47.8
2001/02	5360	76.5
2002/03	5534	56.2
2003/04	6662	73.5
2004/05	6129	82.5
2005/06	4761	93.8
2006/07	4983	94.7
2007/08	4361	93.7
2008/09	4900	86.9
2009/10	4813	84.3
2010/11		85.8
2011/12		73.86

5. Services offered to farmers

1. Land development operations (Surveying, ploughing, harrowing, furrowing, and seedcane supply)
2. Fertilizer supply for both plant crop and ratoon crop (DAP and UREA)
3. Supply of herbicides for chemical weeding

6. Districts served by SONY Sugar Company

1. Rongo District
2. Gucha District
3. Transmara District
4. Uriri District
5. Migori District
6. Ndhiwa District
7. Kuria District

Nb.8% lost to poaching

Appendix.4: Generic SONY Sugar Company Out-growers Cane Agreement

Patrice L. Kokeyo

Fko: 12

Pro 436A A/C No. 252258
026021

K/Lwala Contract Date 4/03/03

(1)

OUTGROWERS CANE AGREEMENT

farmers copy

SOUTH NYANZA SUGAR CO. LTD.

P.O. Box 107, SARE - AWENDO.

SUMMARY

FARMER'S NAME Patrice L. Koko ID No. 0559728

ACCOUNT NUMBER 252258

PLOT NUMBER 436A

FIELD NUMBER 12

SUB-LOCATION Hadera Lwala

PLOT AREA _____ Ha. DISTANCE _____ Km ZONE B

CONTRACT DATE 4th 10/03/03

NEW DEVELOPMENT/REDEVELOPMENT _____

CHANGES

	<u>NAME</u>	<u>SIGNATURE</u>	<u>DATE</u>
1st	_____	_____	_____
2nd	_____	_____	_____
3rd	_____	_____	_____

AUTHORISED BY: _____
(AGRICULTURE MANAGER)

DATE _____

SOUTH NYANZA SUGAR COMPANY LIMITED

OUTGROWERS CANE AGREEMENT

This AGREEMENT is made the 4th day of March 03
BETWEEN the South Nyanza Company Limited a Company incorporated in the Republic of Kenya
and having its Registered Office at Nairobi (hereinafter referred to as the "Company which
expression shall where the context so admits include its successors in Title and assigns) of the one
part AND Patrice Kimumba Mokeya

of _____ the Registered Owner of Plot NO. A36A (herein after referred to as 'the plot')
situated in the location of North Sakwa and Sublocation Kadema Walo of the
Migori District of the said Republic (herein referred to as 'Outgrower' which
expression shall where the context so admits include his heirs successors in title and assigns) of the
other part.

WHEREAS

The Company has been incorporated to own and operate a Sugar Factory at Awendo (herein after
referred to as 'the Factory') aforesaid for the manufacturer of mill white sugar and is desirous of
purchasing sugar cane from the Outgrower and who is desirous of growing sugar cane on the Plot for
the purposes of selling it to the company.

NOW THIS AGREEMENT WITNESSETH as follows:

1. This agreement shall come into force on and from the 4th day of March 03
and shall (unless previously determined in accordance with the provision hereof) remain in
force for a period of five years or until one plant and two ratoon crops of sugar cane are
harvested on the Plot aforesaid whichever period shall be the less

PROVIDED THAT the said period may be extended by the parties hereto such a longer
period as shall be mutually agreed subject to the terms and conditions herein contained by a
memorandum of extension and endorsed hereon.

2. Should the Outgrower decide to discontinue the growing of cane on the plot then he may
terminate this Agreement by giving the Company two years written notice of his intention to do
so and shall fully liquidate any bills or debts which may have arisen due to the contractual
arrangement before being formally discharged from the agreement.

PROVIDED however that such notice shall be effective only if the outgrower reimburses the
Company in full within the said period of two years all monies owing to the Company in
respect of services and materials received by him from the Company upto date of such notice
in accordance with the terms hereof:

3. If at any time during the period of this Agreement or any extension hereof the Outgrower
ceases to own control or operate the plot for any reason whatsoever this Agreement shall be
deemed terminated on the day following the day of completion of the then current harvest or at
any subsequent date that may be decided by the Company which shall not be later than the
date of expiry of this Agreement or any extension hereof.
4. If either party hereto commits a breach of any term or terms of this Agreement and fails to
remedy such breach within thirty (30) days from the receipts of a notice in writing to that effect
given by the other party serving such notice may by a further notice in writing and duly served
upon the defaulting party terminate this Agreement and the Agreement shall stand determined
after completion of the then harvest and delivery of cane there from.

PROVIDED always that if the Outgrower fails to clear the Plot for planting within three months
of the date of commencement of this Agreement or within such further period as the Company
may specify the Company shall be entitled to terminate the Agreement forthwith without giving
any prior notice requiring the Outgrower to remedy such failure.

5. If at any time the Company is of the opinion that the sale proceeds of the next cane harvest of the Outgrower will be insufficient to reimburse the Company with the monies then due to the Company from the Outgrowers then and in that case the company may immediately and without notice to the Outgrower suspend the supply of services and materials to the Outgrower until it is satisfied as the reimbursement of the monies aforesaid.
6. The termination of this Agreement shall not prejudice the rights already accrued to and/or the obligations already incurred by either party prior to the date of termination and shall not prejudice any claim and/or action for damages for breach of contract.
7. If the performance of this agreement or any part thereof shall become impossible of performance by either party due to force majeure the party in default shall not be responsible to the other party for such non-performance and without prejudice to the generality to the other term the following events shall for all purposes of this Agreement fall within the meaning of the term 'force majeure' fire and/or explosion at the factory, flood, earthquakes, tempest, war, civil commotion, riot, arson, sabotage, labour, strikes, lock-outs, or other industrial dispute breakdown or damage to plant machinery transport or equipment shortage of supplies fuel non-availability of shipping space or railway services inability to effect delivery of sugar produced or to transport sugar cane because of road conditions and any other causes beyond the control of the parties hereto such that no reasonable measure of vigilance on the part of the parties hereto or their agents could have presented.
8. (a) The Company and the Outgrower hereby agree that Sony Outgrower Company (herein after referred to as SOC) is established for the purpose of representing the interests of all outgrowers and coordinating such interest with the company.
 (b) The composition of the SOC Board shall be nine members comprising of four elected members by the farmers, District Commissioner, Permanent Secretary Ministry of Agriculture and Livestock Development, Chief Executives (KSA), General Manager (Sony) and a Financier.
9. Should the Government of Kenya at any time impose conditions or decrees which are inconsistent with the terms of this agreement the parties hereto may modify such terms in such a manner as may be agreed or in the absence of such an agreement between the parties the terms hereof shall be modified in such a manner as may be recommended by an independent body (Government appointed agency or Court of Law).
10. The Company shall
 - (a) Purchase in such harvest period from the outgrowers sugar cane in the quantities and date specified in writing from time to time to the outgrower in accordance with terms hereof.
 - (b) With the limit imposed by the construction of roads provide and operate an efficient system of transport (as to which the company shall be sole judge) from the plot to the factory.
 PROVIDED THAT in the event that access to the plot is economically impracticable with the company's transport (as to which the company shall be the sole judge) the transport of cane and cutting thereof shall not be the responsibility of the Company.

The grower

 - (c) Cause the Outgrower's cane to be weighed on arrival at the buying point which shall be the Factory gate or such other place that the Company may at its sole discretion designate and allow the outgrower or his representative to check the weight maintain in duplicate a written or printed record of the weight of each load of cane delivered and give the Outgrower or his representative on the day of delivery one copy of such record (hereinafter referred to as "the Certificate").
 - (d) Become the owner of the cane once it has issued to the Outgrower the certificate.
 - (e) Have sole and absolute charge of all matters directly or indirectly associated with the operation of its transport system and the transloading and weighing facilities at the said buying point.

- (f) Have absolute charge and control of all equipment machinery staff and labour concerned with the operations performed by the Company on the Plot PROVIDED THAT the Company shall exercise due care to ensure that the operational costs to be charged to the Outgrowers shall be kept at a reasonable level as to which the Company shall be the sole judge.
- (g) Be entitled in the event that the Outgrower does not prepare, plant and maintain the plot and cane in accordance with the Clause 11 hereto to carry all or any such operations on the Plot which the Company shall consider necessary to ensure that the Outgrower's quota of cane of satisfactory quality will be delivered on the date in which case the Company shall further be entitled to deduct the cost of these extra operations from the payment to be made for the outgrower's cane.
- (h) Charge interest on any credit that may be allowed by the Company to the Outgrower (such credit only to be allowed on exceptional circumstances) at such rate as may from time to time be notified by the Company and be entitled to deduct interest from the payment due to the Outgrower in respect to the first cane harvest from Outgrower's land subsequent to the grant of the credit.
- (i) Not to be bound by this contract to purchase from the Outgrower any cane which
- (i) has been burnt
 - (ii) is found by sampling to have a First Expressed Juice with apparent purity below 83%
 - (iii) has been harvested by persons other than Company or its agents
 - (iv) is not a variety cultivated from seed cane supplied or approved on the writing by the Company
 - (v) Has not been made available by the Outgrower to the Company on the due date.
- (j) Be entitled to return to the Outgrower at the Outgrower's expense any cane rejected at the buying point under the terms of Clause 10 (i) above.
- (k) If it agrees to accept burnt cane:-
- (i) Not to be liable to pay such cane until the time when the cane would have been due for harvest under clause 11 (h);
 - (ii) Be entitled to deduct a penalty of twenty shillings per tonne (or such other amount as may from time to time be agreed) from the payment for such cane.
- (l) Operate the Factory for a sufficient period in each year to enable the Outgrower to supply all his cane to the Company under the terms of this contract.
- PROVIDED that the Company may suspend the Factory operations at its discretion when it considers it advisable to do so because of weather conditions or because it requires to carry out maintenance replacement or repair of its equipment and machinery.
- (m) Notify the Outgrowers directly through the District Administration of its intention two weeks before starting routine milling operations and one week before routine stopping.
- (n) Pay to the Outgrower the value of the Outgrower's cane at the designated price within thirty (30) days of its delivery to the Factory. From such Payment the Company shall be entitled to deduct all sums due from the Outgrower to the Company including but not limited to all costs and charges billed to the Outgrower by the Company in respect of land preparation and cultivation services, transport and any other services provided to the Outgrower by the Company or its agent or employees under the terms of this Agreement together with any interest payable under the terms of this Agreement; the designated price referred to in this sub-clause shall be the price officially fixed by the Government of the said Republic.
- (o) Be entitled to charge the Outgrower for all work, goods and services supplied to the Outgrower by the Company in accordance with the Company's schedule of charges from time to time in force. Be entitled to charge 50% penalty for compulsory weeding or any other job carried out by the Company where the Outgrower has failed, in order to salvage the crop.

PROVIDED THAT

- (i) the said charge at all times be calculated on basis of the actual or estimated average cost including administrative and other overheads for the time being providing the respective work, goods and services to all contracted Outgrowers.
- (ii) The Company shall inform and consult the Outgrowers' Board regarding any proposed changes in the said charges before such changes are made effective and shall maintain such records as are necessary to show the Board that the charges from time to time in force are calculated as provided in sub-clause (i) above;
- (iii) The Company shall notify all changes to the Outgrower and to the Board at least 7 days before they are due to take effect.

11. The Outgrower shall:-

- (a) Cultivate an area of _____ hectares of sugarcane on the plot in accordance with the terms hereof for this purpose clear such area for planting within 6 months from the date hereof and it is hereby further agreed that the area shown in this sub-clause is subject to amendment following the final survey carried out by the Company of the land to be cultivated.
- (b) Offer for harvest and transport by the Company all such cane as is derived from the plot and no other.
- (c) Plant up the said area as in 11 (a) without delay as soon as he has received seed cane which shall be supplied by the Company or its agents at the plot or as near to the plot as access conditions permit.
- (d) Not dispose of his cane or interest therein to or through any other person without the written consent of the Company-such consent to specify the tonnage of cane which may be sold, the terms on which the sale may take place and the destination of the cane.
- (e) Be responsible for the preparation of the said area for the planting of cane, the application of fertilizers and other materials in accordance with the recommendations of the Company and the removal of weeds or other crops from the said area.

PROVIDED THAT if the Company so requires the Outgrower shall allow all or any such work to be carried out at his cost by the Company and its agents or employees working in conjunction with the Outgrower.

- (f) Not plant or cultivate any variety of cane other than that supplied or approved of in writing by the company; further not to harvest or deliver or cause to be harvested or delivered to the Company any variety of cane other cane herein referred to.
- (g) Either attend himself or send a representative authorised in writing by him to the Factory to witness the conditions of the cane at the time of delivery and to obtain from the Company, its agents or employees the Certificate showing the net weight of the cane delivered and accepted by the Company.
- (h) Permit the Company or its agents or employees to harvest the Outgrower's cane and prepare all such cane for loading, and transport and to load and transport such cane from within the plot to the Factory in a manner and at the time to be determined by the Company and to deduct the cost of all these operations from the payment for the said cane.

PROVIDED THAT in conducting these operations the Company will be responsible for ensuring that the cane is cut close to the ground and that cane is taken to facilitate delivery of the Outgrower's cane to the Factory in accordance with the terms of this Agreement.

- (i) At all times allow the Company to enter upon the Plot together with any vehicles equipment machinery or livestock which the Company in its sole discretion shall require and to pass and re-pass thereover as may be necessary:-
- (i) to inspect the plot and the cane growing thereon
 - (ii) to sample the cane;
 - (iii) to gain access to other Outgrowers' lands, including such construction of access tracks as may be required for the transport of cane produced by the Outgrower or other Outgrowers and
 - (iv) to do anything required to be done by either party in terms hereof

PROVIDED THAT should the Outgrower fail to facilitate the harvesting of his cane at the appointed time the Company shall be permitted to cut any portion of such cane as may be required to provide access to other Outgrowers' plots and in such case the Company will not be liable for any loss or damage suffered by the Outgrower.

PROVIDED ALSO that in exercises of these rights the Company shall take all reasonable care to minimise loss damage or inconvenience to the outgrower.

- (j) Maintain his cane cultivation in a manner which will enable a satisfactory yield to be achieved and for this purpose he shall:-
- (i) each month over a period of seven months in the case of Plant cane and four months in the case of Ratoon cane remove all weeds or other crop plants from the cane area;
 - (ii) Apply at the recommended time and in the recommended quantities all fertilizers and /or other materials recommended by the Company for application;
 - (iii) Undertake the planting and gapping of his cane area at the time recommended by the Company in order to ensure a high plant population, and
 - (iv) Apply all services and goods which he may have obtained from the Company solely for the benefit of his sugarcane crop and for no other purpose.

PROVIDED THAT if the Company so requires the Outgrower shall allow all or any such works to be carried out at his cost by the Company Outgrower;

- (k) Within seven days of receipt of a written notification from the Company that such operations are necessary to achieve a Satisfactory yield of cane allow unimpeded access to the Company its agents employees and its equipment for the purpose of carrying out any or all operations which the Outgrower has failed to carry out any or all operations which the Outgrower has failed to carry out or, in the opinion of the Company, is likely to fail to carry out.

PROVIDED THAT such notification shall have either been handed to the Outgrower or his representative and acknowledged or shall have been posted to the outgrower by registered mail;

- (l) Bear all direct and indirect costs of the works goods and services supplied to the Company under this Agreement and (unless the same are paid earlier) allow such costs to be deducted from planting for cane supplied by the Outgrower.
- (m) Permit all monies due from the outgrower to the Company (including the cost of harvesting preparations for loading, unloading and transporting) to be deducted from the proceeds of cane supplied by the Outgrower to the Company.
- (n) Be responsible for maintaining suitable permanent boundary markers and cleared fire breaks for his area of cane.
- (o) Be liable to pay the cost of any damage suffered by other Outgrowers as a result of failure to comply with the terms hereof.

- (p) Take precautions against cable fire accordingly to the advice of the Company or its representatives.
- (q) Not assign his land or any interest therein or any of his rights or obligations under this Agreement without the written consent of the Company.

12 In the event of the farmer being rendered physically disabled, dead or incapacitated due to physical illness, mental instability or absolute insanity the third party herein under nominated by him by assignment contract or nominated by his family members and supported by sworn affidavit before a Magistrate or Commissioner of Oaths shall act as his appointed attorney with all the powers to execute all deeds, contracts and documents and receive as trustee for the farmer's beneficiaries and heirs all monies, cheques, promisory notes and any negotiable instruments and dues payable to the farmer arising out of the Outgrowers cane Agreement aforementioned or any other collateral contracts entered into between the farmer and the miller.

13 Any dispute or question which may arise at any time between the parties regarding the construction of the Agreement or the rights or liabilities of the parties shall be referred to the decision of a single arbitrator to be agreed upon between the parties or in default of agreement within fourteen (14) days after service by one of the parties hereto on the other notice of two existence of such dispute, difference or question to be appointed at the request of either party by the Chairman for the time being of the Law Society of Kenya and such arbitration shall be conducted in accordance with and subject to the provision of the Arbitration Act chapter 49 Laws of Kenya as maybe amended from time to time.

IN WITNESS THEREOF the Company by its authorised representative and the Outgrower have hereunder set and subscribed their respective hands the day and year hereinabove written.

SIGNED SEALED AND DELIVERED
by the Authorised Representative of
The South Nyanza Sugar Co. Limited
in the presence of:-

SIGNED SEALED AND DELIVERED
by the within name PATRICE L. KIKOYO
OUTGROWER in the presence of:-

Asst/Chief - Witness Z.D. Okeyo
The farmer hereby appoints

1. Mr/Mrs _____
and give him/her the power of Attorney
over the plot.

2. I have collected one copy of the
Outgrowers cane Agreement and agree to
act on behalf of the farmer

Signed [Signature]
Mr/Mrs J. O. Mokeyo
(Agent)



[Signature]
OFFICE OF THE ASST CHIEF
KANYAGREBA SUB. LOC
N/BAKWA LOC.

Farmer's ID/NO. 0559128

Attorney's ID/No. _____

Agents ID/No. 1871620

Appendix.5: Questionnaire for Scientists

SURVEY CONDUCTED ON _____ TO _____

1. Name and institution of the Scientist-----

2. Area of Research -----

3. Which sugarcane varieties are recommended for the area and why?

4. What is the appropriate land preparation regime recommended for the contracted farmers?

5. What are the appropriate planting methods recommended for the farmers?

6. What are the appropriate weeding regimes recommended for the farmers?

7. What appropriate types and doses of pesticides, and herbicides do you suggest to your contracted farmers?

Pesticides, ----- Herbicides-----

8. How much use of fertilizer do you suggest per acre of sugarcane farm?

Urea ----- DAP ----- other -----

9. Have you found any changes in soil due to excessive use of pesticides, and chemical fertilizer in the sugarcane farms?

10. Do you find any changes in sugarcane productivity (yield and sucrose) due to excessive use of pesticides, and chemical fertilizer in the sugarcane area?

11. What are the causes of depletion of soil mineral due to sugarcane crop and how can it be stopped or recovered?

12. Do you think that the sugar industry and sugarcane growers should pay more attention on soil erosion?

13 What are the appropriate harvesting periods for plant crops and ratoons?

14. What are the appropriate harvesting methods recommended for the farmers?

15. Any research facility for sugarcane and growers in your institution?

16. Any Scientific suggestion for reducing the impact of soil erosion due to sugarcane and sugar production?

Appendix.6: Questionnaire for sugar manufacturers

Survey conducted on _____ to _____

1. Name and Location or address of the Mill.
2. How much is your sugarcane crushing capacity? -----
3. Size of farm owned by the mill? -----
4. Number of Labour employed by mill? (Permanent -----, seasonal -----)
5. Level of Skill of the labour unskilled ----- semi-skilled ----- skilled -----
6. What is the average wage rate of labour in your sugar mill for? :
Unskilled ----- semiskilled ----- skilled -----?
7. Do you have a social security system?
Health -----, education -----, insurance -----, transport -----
8. Do you follow labour laws? -----
9. Do you provide training facilities to laborers --- or farmers -----
10. Do you provide credit to farmers? -----
11. Do you have a contract with growers for the purchase of sugarcane?-----
12. Do you pay quality premium to growers? Yes OR No if yes how much?
13. Are you satisfied with the use of Cess funds for the improvement of access roads?-----
14. How much sale of byproducts contributes in the overall income of the mill? ---
15. What safety measures have you taken to avoid environment effects of waste water, smoke and burning of sugar wastage? Hazards? -----
17. What is the payment schedule to growers? -----
18. How much is the average cost of per ton sugar production? Ksh/ton -----
19. What is the mill gate price of per ton sugar? -----
20. How much is the profitability margin in per ton sugar sale in domestic market.
21. What you would suggest to minimize the cost of production to remain competitive in the international markets? -----
22. Are you aware about the Sugar Arbitration Board and its role?-----
23. The COMESA safeguards will be coming to an end in February 2013? What do you foresee as the impact of sugar influx on the sugar industry in Kenya
24. Are you enjoying any production or export subsidy provided by the government to be competitive in the international market?
If yes in what form and how much -----
If not would you demand and in what form and how much? -----
25. What effective tariff protection or non tariff measures would you suggest restricting sugar dumping in the country at the beginning of 2014 when the COMESA safeguards expire? -----
26. How much surplus sugar y can you export each year. -----
27. In which markets do you think your exports are competitive?
1. 2. 3. 4. 5.
28. Which countries' are Kenya's major competitors to different markets?
1. 2. 3. 4. 5.
29. What type of export subsidies are they enjoying from their governments?

Appendix.7 Focus group discussion guide

To be used by enumerators

Thank you for agreeing to participate in this activity. We are very interested to hear your valuable opinion on how the sugarcane industry is performing in Migori District. We are here to learn from you. As part of a team that is conducting research for the community needs assessment and your contribution is important and will contribute to the community

Introduction

The purpose of this study is to learn how the farmers view sugarcane farming and how satisfied they are with the income that they receive from sugarcane. The aim is to learn how the government and SONY sugar company can improve the sugarcane income to increase farmer participation in the SONY contract scheme in Migori County. The information provided is strictly confidential and whatever you say in the focus group will not be associated with your name or family. Fellow participants will also be requested to respect each other's confidentiality. No individual name or family name will be attached to the focus group that will be able to identify you and the record sheets will be destroyed as soon as they have been analyzed. You may decide not to answer any question or withdraw from the group discussions at any time without any consequences. Any queries during the focus group discussions or later can be referred to the facilitator or the team leader whose name and phone number are indicated below

Please tick the boxes on page 2 and sign to show that you accept to participate in the focus group discussions voluntarily.

Please check one box

SONY Sugar Company contracted farmers Non-contracted farmers

Date of Focus Group: _____

Location of Focus Group: _____

Name of Facilitator: _____

Consent

I voluntarily consent to take part in the focus group discussions and the purpose of the group discussion has been explained to me.

Please Print Your Name

Date

Witness signature Date

Procedure

1. Climate setting

Introduce yourself and pass round the coded sign-in form with basic information about the participants to fill.

Explain briefly what the research is all about, why they were asked to participate and how the information obtained from the focus group/community will be used.

2. Ground rules

Let the participants suggest ground rules through brainstorming session.

3. Address any queries before the sessions begins.

4. Begin the discussions and by using probes ascertain that all issues are addressed

Questions

1. Open the discussion by seeking the farmers overall perception about sugarcane farming?

2. What are the good things about contracting with SONY Sugar Company?

3. What don't they like about contracting with SONY Sugar Company?

4. Have the farmers ever considered opting out of contract farming and if so why? If they ever considered opting out, which other enterprises do they consider to be more profitable?

5. What suggestions do they have to improve SONY sugar contract to keep them registered and continue with contract farming?

In-depth Discussions

- Sugarcane income from contract and non-contract farming
- Household and agricultural assets of contract and non-contract farmers
- Benefits of contracting and non-contracting
- Constraints to contracting and non-contracting
- Major Costs in contract and non-contract farming
- Major channels of marketing sugarcane in general

- labour requirements in contract farming and non-contract farming
- Availability of sugarcane extension services for contract farming and non-contract farming
- Availability of company employees when required to solve farmer problems and supervision
- Harvesting duration contract and non contract
- Standard of living contract and non-contract
- housing
- agricultural assets
- Food security contract and non-contract
- Education for children contract and non-contract
- nature of contractual arrangement, registration,
- Sugarcane production, incentives, transaction costs and marketing costs.
- Data on the benefits and problems in input procurement and marketing of the produce
- Thank you for participating and sharing your views and opinions with us.

END

Appendix.8: Summary of the outcome of Focus Group Discussions

1. Benefits and Advantages of contracting with SONY Sugar Company

- Inputs provided by the contracting company on credit
- Roads maintained by the company
- Assured market for the produce
- Advance on sugarcane for school fees, or emergencies
- Services offered to farmers
 1. Land development operations (Survey, ploughing, harrowing, furrowing)
 2. seedcane supply
 3. Fertilizer supply for both plant crop and ratoon crop (DAP and UREA)
 4. Supply of herbicides for chemical weeding
 5. Harvesting
 6. Transport (input supplied and sugarcane harvested)

2. Production and Marketing constraints of contracting with SONY Sugar Company

- Biased contract terms which are favourable to the agribusiness firm
- High interest rates charged on production inputs provided on credit
- High cost of fertilizers above market rates due to high interest rates charged
- High company rates for services – land preparation and harvesting
- Fraudulent charges for undelivered support services such as extension services
- Inadequate extension services and training
- Delayed sugarcane harvest beyond 24 months
- Faulty weighing and weighing machines
- Harvested sugarcane left on the ground not transported due to bad weather and impassable roads
- Burnt sugarcane by arsonist or through accidental means transported to the factory and rejected on grounds of deteriorated quality
- Poor quantity and quality of seedcane supplied to the farmers through credit
- Low sugarcane yielding varieties

- Fraudulent filling of job completion certificates and thus inaccurate sugarcane harvest records
- Sugarcane loss due to breakdown of harvesting machinery during transportation,
- Poor quality of harvesting by sub contractors (cutting high above ground level)
- High sugarcane loss due to spillage during loading, and transportation
- Theft of sugarcane stacks left overnight due to lack of collection during the day
- Poor land preparation methods by the contractors i.e. farming up and down instead of along the contour.
- High transportation costs
- Lack of farmer representation at high decision making bodies of the organization. The Out-growers Company collapsed due to mismanagement
- Erroneous deduction from the sugarcane proceeds
- Lack of credit facilities for farm development
- Poor seedcane delivery method = left far from the plot

Appendix.9: Conditions for granting Kenya a four year COMESA safeguard to February 2012

The extension was granted subject to certain conditions, including:-

- 1 Rising sugar import quota in tandem with a declining tariff as follows: - 2008/09 = 220,000 tons quota (100% tariff rate); 2009/10 = 260,000 tons quota (70% tariff rate); 2010-2014/11 = 300,000 tons quota (40% tariff rate); 2011/12 = 340,000 tons quota (10% tariff rate); and then 1st March, 2012 open market.
- 2 The Government adopts a privatization plan within the first 12 months and takes verifiable steps to privatize the remaining publicly owned factories by 2011
- 3 The industry to implement cane payment system based on sucrose content instead of weight
- 4 The Government adopts an energy policy aimed at promoting co-generation and other forms of bio-fuel production that will contribute to making the industry more competitive
- 5 Kenya Sugar Board (KSB) to increase funding for research on high yielding and early maturing varieties and spearhead its dissemination by farmers
- 6 The Government to increase funding for road infrastructure
- 7 The Government to submit twice yearly performance reports to the COMESA Council on all measures, activities and improvements on the sugar sector's competitiveness.

NB₁ Sugar prices in Kenya need to drop by at least 39% to be in line with COMESA levels. Such a price drop in less than 3 years is drastic and requires major cost reduction strategies for the industry.

NB₂ The COMESA safeguard measures have since been extended to February, 2014.

Appendix.10: Growers' Survey Questionnaire

The Study Topic:

An assessment of the factors affecting contract farming in Migori County.

Introduce yourself as part of a sugarcane study in your Division which is part of Migori County

Purpose

To assess the factors that influence participation in the SONY Contract scheme and the impact of participation on the household and agricultural assets of farmers in Migori County.

The study will include interviews with sugarcane growers both contracted and non-contracted, the millers and those interested in the sugar industry in Kenya. The study will be used to inform and advise SONY Sugar Company and the Kenyan government on how to manage the sugar industry in Kenya

Questions

We would like to obtain some personal and business data from you and to document your perceptions about different aspects of sugarcane cultivation in your area and Migori County as a whole.

The interviews will include questions about:

- (i) How you earn your living.
- (ii) Your knowledge and experience of sugarcane cultivation.

Your input is highly valued, and the information provided by you will assist the government to improve support services and promote the sustainability of sugarcane farming throughout the country.

Timing

The interview will take at least 45 minutes

Confidentiality

Answers are confidential and will be used strictly for research purposes only. It will not be used against you now or in the future. You can stop the interview at any time and skip questions you don't want to answer.

You do not have to participate.

ASK THE INTERVIEWEE IF THEY ARE SUGARCANE GROWERS AND AGREE TO PARTICIPATE IN THIS SURVEY. IF NOT, PLEASE COMPLETE THE NAME ONLY ON THE RECORDING SHEET. IF YES, PROCEED WITH THE

INTERVIEW AND REMEMBER TO RECORD THE INFORMATION BELOW,
BEFORE CONTINUING WITH THE QUESTIONNAIRE.

Interview number _____ Date _____
 Division _____
 Sector _____
 Name of Sector Head _____
 Distance from sector
 head office _____ Km
 Start Time _____

Interviewer: _____
 Location _____
 Village _____
 Name of Village Elder _____
 Distance from village elders
 farm _____ Km
 End Time _____

Would you like a copy of the summary report of the survey results? YES NO

WHERE REQUIRED PLEASE TICK THE MOST APPROPRIATE ANSWER

SECTION A: FARMER AND FARM CHARACTERISTICS

1. Name of respondent? _____ Gender Male Female

2. Marital Status

Single		Married		Divorced		Widow(er)	
--------	--	---------	--	----------	--	-----------	--

4. What is your age (years)? _____

3. What do you do on the property?

Owner	Husband or wife	
Child of the owner	Leaseholder	Employee
Relative	Other(specify) _____	

4. How long have you lived in this area?

> 20yrs		<20 yrs		<10 yrs			
---------	--	---------	--	---------	--	--	--

5. How do you characterize your house?

Permanent		Semi Permanent	
-----------	--	----------------	--

6. What is the house built from (owner of the farm)?

Masonry wood Mud

7. What is the size of your household size (Total)? _____

8. Number of dependents living in the household?

Females < 15yrs		Females 15-65yrs		Female>65	
Males < 15yrs		Males 15-65yrs		Male>65	

9. Education level of parents and children (please tick)

Education Level	Mother	Father	Number of children > 7 years	
cannot read and write				
Std 8 and below				
Form 1-4				
Form 5-6				
Vocational college				
College and above				

10. Who does the following farm duties? (Indicate as follows: Men only=1, Mainly men = 2, Men and women equally = 3, Mainly women = 4, women only =5, Not done = 6)

Activity	indicate	Any comment
1. Cultivation		
2. Planting Sugarcane		
3. Fertilizer application		
4. Weeding		
5. Spraying and general crop maintenance		
6. Harvesting		
7. Machinery Maintenance		
8. Book-Keeping		
9. Housekeeping and Other Domestic Duties		

11. members of family and hired labour responsible for sugarcane activities

Activity	Males(>15yrs)	Females(>15yrs)	Boys(<15yrs)	Girls (<15yrs)
Land Preparation				
Fertilizer application				
Planting				
Weeding				
Harvesting				

SECTION B: LAND, AGRICULTURE AND PRODUCTION MANAGEMENT INFORMATION

1. What is the total arable area of your farm? _____ Ha
2. Please indicate below of all the land cultivated, what you own or rent out and the crops grown in each parcel: [Ownership status (I own and cultivate this land=1, I own but do not cultivate this land=2, I rent out this land=3, I am a shareholder= 4, other(specify) = 5]

Parcel	Ha	Ownership status(No)	Crops Grown
Total			

3. What is the total land assigned to sugarcane only currently _____Ha

4. What was the total land area assigned to sugarcane only (5) years ago? _____Ha

5. What was the estimated yield from this area (area in 4 above)? _____Tons

6. What was the total Land area assigned to sugarcane (10) years ago? _____Ha

7. What was the estimated yield from this area (area in 6 above)? _____Tons

8. Do you apply long-term pre-emergent herbicides? YES NO

9. Have you ever undertaken a soil sample in your field?

YES NO

10. If yes in 9 above, When? _____(year)

11. Based on soil sample recommendations, do you apply the full recommended amount Of fertilizer/lime to each field? YES NO

12. If No in 11 above, why? _____

13. How many hectares of sugarcane replanting have you done annually in the last 5 years?

Year	Area replanted(ha)	Varieties	Did you use certified seed cane OR seed cane with a history of hot water treatment and disease inspections?	
			Yes	No
2006/07				
2007/08				
2008/09				
2009/10				
2010/11				

14. Why did you replant with these varieties? _____

15. Do you Keep farm records of any kind? YES NO

16. What type of production record keeping system do you use?

Type	Yes	No	Type	Yes	No
Non			Own manual system		
No formal system			External consultant		
Own computerized system (e.g. Excel)			Other (please specify) _____		
Other specialized computerized system (e.g. CanePro, Plan-a-head, etc)					

17. What type of financial record keeping (book-keeping) system do you use?

Type	Yes	No	Type	Yes	No
Non			Own manual system		
No formal system			Other External consultant		
Own computerized system (e.g. Pastel, Plan-a-head)			Other (please specify)		

18. Do you own any Livestock? YES NO

19. If yes what do you keep them for?

Livestock	Product or Service	For Subsistence	For selling	Other (specify)
Cows				
Bulls				
Poultry				
Goats				
Sheep				
Any other(specify)_____				

20. Please indicate the agricultural implements owned below:
(e.g. hoe, panga, sprayer, oxen plough, etc.)

Agricultural Implement	Estimated value (Ksh)

SECTION C: FARM INCOME, EXPENDITURE, AND SAVINGS INFORMATION

1.Has any financial institution provided you with production finance in the last 5 yrs

YES NO

2. If yes which financial institutions and rank the quality of service
 (Please rank the quality of service provided by this institution as 1 = very poor, 2 = poor, 3= good, 4 = excellent)

Financial institution	Farm operation financed	Quality of service

3. How can this institution improve their service? _____

4. Indicate whether you have received any of these forms of farm support and if so when you received them:

Source	Amount (Ksh)	Year(s) received
Government grant		
Inputs from Department of Agriculture(fertilizer; chemicals)		
Inputs from SONY Sugar Co.		
Inputs from any other milling company(specify company)___		
Inputs from Church organization(specify church)_____		
Any other(specify)_____		
General Comments		

5. What are your sources of contribution towards financing farm operations?

Source	Amount(Ksh)	Comments if any
Savings		
Government grant (specify which grant)		
Sale of assets		
Sale of a business		
Pension		
Retrenchment package		
Personal borrowing from family members		
Loan against insurance policy as collateral		
Informal money lender		
Insurance policy		
Other (please specify)		

6. How much time (hours) do you allocate on average to farming activities each day?

7. Please indicate income from your major farm enterprises below

Crop	output /ha per season	Amount consumed	Amount sold	Unit price
Sugarcane				
Maize				
Beans				
Cassava				
ground nuts				
Sweet potatoes				
Vegetables				
other crops(specify)				

Livestock	output	Amount consumed	Amount sold	Unit price
Dairy				
Poultry				
Goats				
Sheep				
Any other_____				

8. Please indicate your average annual gross farm income (turnover) for the last 5years__

9. Please indicate the amount spent on agricultural inputs in sugarcane production in 2011 (Ksh)

Herbicides		Fertilizer					
Pesticides							

10. What percent (%) of average annual turnover does sugarcane contribute? _____

11. What is your average household living expenses (e.g. groceries, medical expenses, clothing, electricity, water, rates, school fees, etc) each month? Ksh_____

12. Do you have any off-farm income? YES NO

13. If yes in (11), what are the sources of this off-farm income? [Please rank 1 for the most important source of income and 2,3,4,5 for the proceeding successive income sources.

Source of Income	Rank	specify (what type)	who in the household decide on the income
Sale of crops			
Sale of animal and their products			
Sale of labour			

Own business			
petty trading			
Contracting			
other (please specify)			

14. If Yes in (12), what is your average annual gross off-farm income (Ksh)?(please tick)

1-25,000	25,000-500,000	500,000-1,000,000	1,000,000-1,500,000	Over 1.500,000

15. Do any of your dependents (e.g. spouse or children) have off-farm income?

YES NO

16. If Yes in (15), what is the average annual off-farm income from your dependents (Ksh)?

1-25,000	25,000-500,000	500,000-1,000,000	1,000,000-1,500,000	Over 1.500,000

SECTION D: SUGARCANE FARMERS ATTITUDE TOWARDS RISK

1. Please indicate your willingness to take risks relative to other farmers in your area.

Much less willing	Slightly less willing	Similar	Slightly more willing	Much more willing

2. Please indicate the risk management strategies that you commonly use:

Strategy	Yes	No	strategy	Yes	No
Enterprise diversification			Livestock insurance		
Off-farm investment			Other (please specify)		
Crop insurance					
Fire insurance					
Keep cash reserves					

3. Would you sell your farm to reduce your losses in a financial and/or agronomic crisis?

YES NO

Why? _____

4. What would you do to cope with an unanticipated drop in annual gross farm income?

D. EXTENSION SERVICE

1. How do you learn about agricultural information? Please rank the 5 most important channels 1,2,3,4 etc.

Channel	YES/ NO	Rank	Comments if any
Television channels			
Local radio channels			
National radio channels			
Local press			
National press			
Internet			
Posters and Brochures			
Village meetings			
Other (specify)			

2. What are your most important sources of information on sugarcane production and rate the usefulness(rate as 1= most useful up to 10 least useful

Source of information	YES/ NO	RANK	Comments if Any
Radio programmes			
TV programmes			
Family			
The local cane growers office			
Government Agency			
Company extension service			
Milling company			
NGO			
Other Cane Growers			
Milling Company Representatives			
Locally Elected Leaders			
Agricultural Supply Firms			
Others(Specify)_____			

3. Have you received any agricultural extension/training during the last 5 years?

YES

NO

4. On which farm enterprises did you receive agricultural extension/training in (3) above?

Enterprise	YES/NO	Year	Type of Training
Sugarcane			
Livestock production			
Staple crops(maize, rice cassava,			

Protein crops(e.g. beans, groundnuts)			
Vegetables			
Any other(specify)_____			

5. If you have received training on sugarcane production in (6) above please describe the source, and quality of training. (indicate the quality of advice provided as 1 =very poor,2= poor,3= good,4 = excellent)

Year	Source	Training	Quality	Any comments

6. Have you used the suggestion given?

YES

NO

7. If your answer is yes, what are the changes made after suggestions?

1. _____
2. _____
3. _____

8. What benefits did you get as a result of your participation in the training in (5) above?

Benefit	YES/NO	Comments if any
Improved Income		
Education		

9. Is the mill contractor providing any specialized technical or financial training or guidance on farm management practices in sugarcane production?

YES

NO

10. If yes in (9) above please indicate the training

11. Do you consider yourself experienced in these disciplines

Discipline	YES	NO	Period (Years)	Comments if any
Agriculture				
Finance				
Management				
Other (specify)_____				

12. How many permanent staff do you have? _____

13. What percentage (%) of your permanent staff has attended a training course in their area of operation/responsibility? _____

E. MARKET APPROACH

1. Where did you market your sugarcane harvest in the last 5 years?

(please indicate below as 1=Contractor, 2= Middlemen, 3=spot market(jaggery processor), 4=Syndicate, 5= Other(specify)

Year	Ha	Tons	Contracted	Non-contracted	Where to (no. above)	Specify(name)
2010/11						
2009/10						
2008/09						
2007/08						
2006/07						

2. If contracted in (1) above how far (Km) is your farm to the miller? _____ Km

3. If contracted in (1) above what is the period of Agreement(years)_____

4. How many tons of sugarcane did you harvest last?

_____Tons_____Ha_____Year

5. Who harvests your cane? (Tick)

Self Syndicate Contractor Middlemen

Other (please specify)_____

6. How often do you check the quality of harvesting, specifically base cutting, topping height and the level of extraneous matter?

Daily	<input type="checkbox"/>	Every second day	<input type="checkbox"/>	Leave it to the supervisor or contractor	<input type="checkbox"/>
-------	--------------------------	------------------	--------------------------	--	--------------------------

7. Is your cane burnt/trashed at harvest?

YES

NO

8. If contracted, what is the average planting to harvest period (months) for plant crop for your cane in the last 5years?

<24	24-30	31-37	38-44	44-50	>51	Unknown	<input type="checkbox"/>
-----	-------	-------	-------	-------	-----	---------	--------------------------

9. If contracted, what is the average planting to harvest period (months) for ratoon crop for your cane in the last 5 years?

<18	18-22	23-26	27-30	31-34	>34	Unknown	
-----	-------	-------	-------	-------	-----	---------	--

10. If contracted, what is the average time (hrs) required for marketing (harvest to factory gate delay) for cane harvested on your farm?

<24	24-36	37-48	49-60	>60	Unknown		
-----	-------	-------	-------	-----	---------	--	--

11. How much is the loss of sugarcane weight due to stay outside the mill?

significant little Non

12. What is the payment schedule by the miller? No of days _____

13. what is the mode of payment cash Cheque

14. Marketing attributes with the buyer(indicate YES or NO)

Attribute	Contract	Non-contract	Comments (%)
• Price fixed with the buyer at planting			
• Quantity demanded fixed with buyer at planting			
• Grading required by buyer			
• Payment by cash immediately after delivery			
• Payment by cheque 2 weeks after delivery			
• Free to deliver produce when ready/available			
• Delivery scheduled by buyer/contractor			
• Produce sold at farm gate			
• Produce transported to the factory/milling plant			
• Investment needed to enter market	No investment		
	Minimal investment		
	Significant investment		

15. Are you interested in expanding your sugarcane production?

YES NO

16. If Yes, up to what extent _____ Ha. Reason _____

17. If No what are your reasons? (Please rank 1,2,3,4 etc)

Reasons	Rank	Comments if Any
Land shortage for sugarcane		
Labour problem		
I prefer other crops		

Marketing problem		
Not profitable		
Other specify _____		

18. Does the road network affect accessibility of produce to the market?

YES NO

19. If Yes for which produce?

Produce	Very Much	Much	Not At All

20. What other marketing problems do you face and how can they be removed?

Marketing problem	How they can be removed

F. PERCEPTIONS AND EXPECTATIONS

1. What are the main reasons for growing sugarcane? _____

2. What should be the role of government to enhance the productivity of sugarcane in your area? _____

3. Do you think sugarcane production is more productive than any other farming enterprise in your area?

YES NO

4. If No which other crops could be more profitable than sugarcane (in order of priority if more than one)

1. _____
2. _____
3. _____
4. _____

5. How is your income status or standard of living when compared to 5 years ago?

Better Worse The Same

6. What is the reason for this? _____

7. Farmer attitude towards issues affecting growers at the local or community level

Issue	Very positive	positive	negative	very negative	No impact
• Cane contract arrangement					
• Cane planting					
• Cane cultivation					
• Farm input provision					
• Weeding arrangement					
• Harvesting duration					
• Harvesting arrangement					
• Transport arrangement					
• Payment system					
• The mill processing capacity					
• other(specify)_____					

8. What happened to your sugarcane production (yield) in the last 5 years?

Increased decreased did not change

9. Why did sugarcane production increase? (please tick as much as relevant)

Reason		Comments if any
Contract terms got better		
The quality of seeds got better		
Usage of chemical fertilizers and pesticides have increased		
I bought agricultural equipments		
My management style got better after training		
Other, please specify_____		

10. Why did your sugarcane production decrease? (please tick as much as relevant)

Reason		Comments if any
Decreasing soil fertility		
Lack of agricultural equipments		
Not using enough fertilizer/pesticide		
Lack of labour		
High cost of inputs thus using less		
Unfavorable climatic conditions		
Lack of credit for farm operations		
Other, please specify_____		

11. What are the solutions you are taking to solve the problems?

Constraint	Solutions

12. What are the major constraints of sugarcane production in the area in general?
 (Please rank * 1 = most serious constraint: highest number in the list: the least constraint=10)

Constraint type	Give explanation	Rank in order*
Information shortages/inadequate training		
Contractor unreliability		
poor soils		
low rainfall(drought)		
lack of fertilizer		
high cost of inputs		
lack of seed		
crop insect pest and diseases		
lack of credit		
lack of equipment		
delayed cane harvesting		
market problem		
low price of produce		
faulty grading by buyer		
provision of inputs at higher rate		
delay in inputs delivery		
cheating by agency		
poor quality inputs		
lack of government control		
delay in procurement of produce		
lack of government control		
delayed payment for produce		
Longer hungry season due to sugarcane		
Low payment rate by contractor		
poor service delivery by firms		
scarcity of labour during peak periods		
Other (specify)		

*For hungry season indicate duration(months) _____

13. Please respond to this statement: —'Annual profits from sugarcane farming are low relative to the land value“.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	Other (specify)

14. Please respond to this statement: —The long-term sugarcane supply agreement constrains you from diversifying into other farm enterprises“.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree

15. How do you consider yourself?

	Comment if any
Very poor	
Poor	
Lower middle income level	
Middle income level	
Higher middle income level	
Rich	
Very Rich	

16. Please comment below on any other aspects of the SONY Sugar out grower scheme and/or your experience with any of the industry role players that concern you:

Signature (principal decision-maker)_____Date:_____

Thank you very much for your valuable participation. Your confidential contribution is greatly appreciated.

If you have any further questions about this survey, please contact:

Mr. Lumumba Kokeyo,

University of Nairobi,

Department of Agricultural Economics

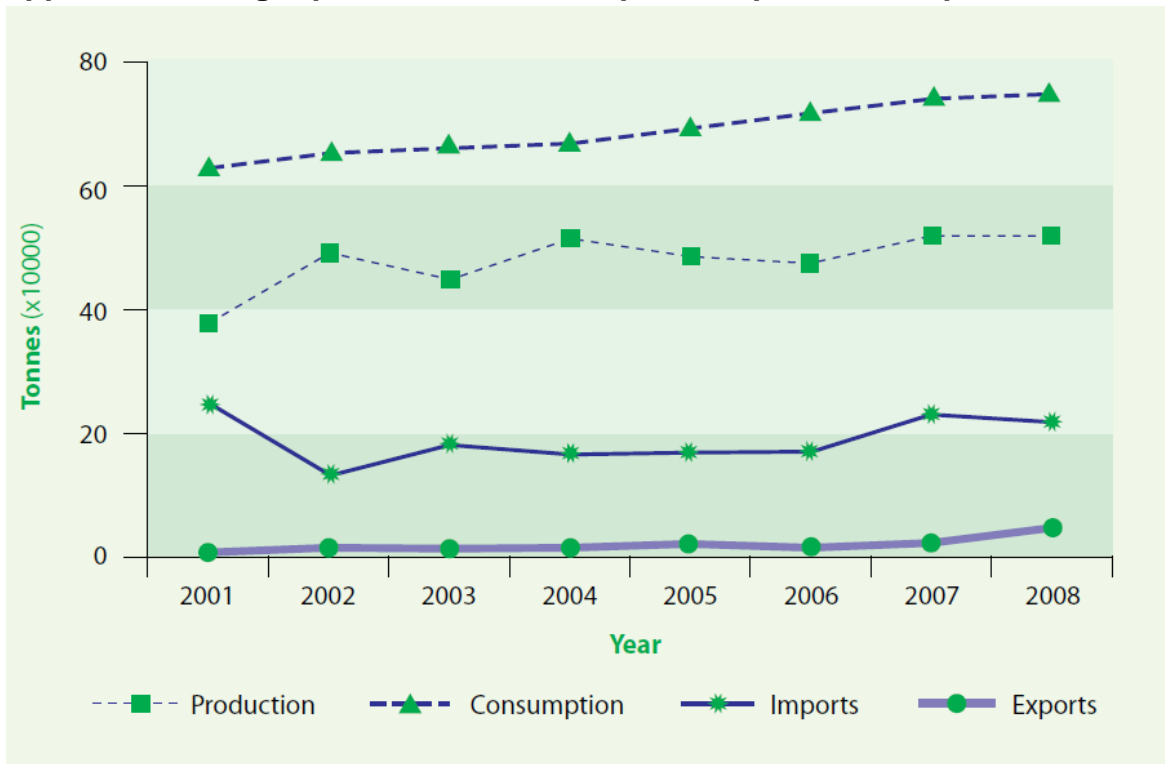
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Appendix.11: Sugar production, consumption, imports and exports trends



Source: (Kenya Sugar Board, 2009)