Contract Farming and Smallholder Farmers in a Global Economy: The Case of Mtibwa Cane Growers in Mvomero Tanzania

A Thesis
Presented in Partial Fulfilment of the Requirements for the Degree Master of Science
in the Graduate School of the Ohio State University

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The Ohio State University
2014

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Abstract

Contract farming has been practiced in the sugarcane out-grower schemes at Mtibwa Tanzania for more than a decade. Even though in developing countries contract farming is viewed as an important institutional innovation for improving the productivity and output of smallholder farmers, this has not happened to out-growers at Mtibwa. Therefore, this study sought to answer five main questions: 1) How are growers organized in the sugarcane commodity chain? 2) What factors influence growers to choose one contracting chain over the other? 3) What are the perceptions of partially and fully integrated farmers regarding the advantages and disadvantages of contract farming? 4) What are the main areas of concern of grower participants in sugarcane production? 5) Do partially and fully integrated farmers differ in terms of their perceptions of the main areas of concern? The commodity chain analysis and the theory of diffusion of innovations offered the framework for the study. A multi-staged sampling procedure was adopted to design the study and multi-methods used to collect data. The results showed that there were two main categories of farmers: those who were fully integrated into contract and those who were partially integrated into contracts. The two categories of farmers differed in terms of resource endowments including level of education, land size and off-farm income. Farmers were organized under three farmer organizations which acted as intermediaries through which farmers were contracted.

The major reason that influenced growers to register with a certain organization was because of its proximity or experience with an organization and main benefits
obtained were cane cutting, loading and transportation; second credit and third information.

In general partially integrated farmers had favourable perceptions of advantages but fully integrated farmers also had favourable perceptions of extension, new technologies, and reliable markets. On the other hand, the results showed that fully integrated farmers perceived more disadvantages compared to the partially integrated farmers. However, the difference in perceptions between the two categories of farmers was not significant.

Four main areas of concern were identified to include manipulation of quotas, delayed payment, lack of transparency in determining the weight of cane and measuring sucrose content. Partially and fully integrated farmers had unfavourable perception about being paid on time. Partially integrated farmers perceived that quotas are not manipulated whereby the fully integrated perceived that quotas are manipulated. Finally, both groups of growers perceived that there was a lack of transparency in determining weigh of sugarcane and the sucrose content.
Dedication
In memory of my father, Mr. Martin K. Gabagambi
Acknowledgement

I thank God the Almighty for giving me good health and strength during this study.

I am indebted to many people for their invaluable support throughout the process of completing my studies and this research.

To my advisor Dr. Jeff Sharp, I am greatly indebted for his professional wisdom as well as his patience and encouragement. Without his support writing this thesis would not have been possible.

I am also indebted to my local advisor, Prof. Dismas Mwaseba, his professional wisdom and encouragements are highly appreciated.

I also thank Drs Mark Erbaugh and Linda Lobao for serving on my graduate committee. Their critical comments during the design of the study and on the defense were very helpful.

I am grateful to the entire staff of IPA at OSU, especially Pat Rigby, David Hansen, Mimi Rose and Ryan Hottle; their support is highly appreciated. I remain also indebted to all staff at iAGRI, SUA for their invaluable support.

Thank you to USAID through iAGRI project at SUA who provided financial support that enabled me to study at one of the renowned university in the world, the Ohio State University.

Last but not least, I remain indebted to my family for their patience, inspiration and heartfelt support during my study. They gracefully accepted my long absences while I was in the USA and during field work in order to make this study a success.

The list is very long, but to you all I say ‘ahsanteni sana’ ‘thank you very much’.
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CHAPTER 1
INTRODUCTION

1.1. Emergence and importance of contract farming

Global economic integration and market liberalization have led to the emergence of contract farming as an important development strategy for promoting the transition of smallholders in sub-Saharan Africa from subsistence to market oriented commercial production (Maertens and Swinnen, 2007 and Bolwig et al., 2009). Under the contract system, a farmer agrees to supply a pre-agreed quantity and quality of produce at a pre-agreed price and time, to the processing or marketing firm, which may provide access to technical assistance, production inputs and finance (Singh, 2005).

Factors that have led to the emergence of contract farming include but are not limited to the rise of supermarkets as major actors in the domestic food supply chain, the implementation of strict traceability requirements in response to consumers’ concern about food safety issues, greater concentration within agricultural supply chains, improvements in information and communication technology and changes in transport and logistics (Prowse, 2012; Reardon et al., 2003 and Hobbs et al., 2001)

In the context of developing countries, contract farming is viewed as an important institutional innovation for improving the productivity and output of smallholder farmers that can lead to improved farmer incomes and livelihoods. It is believed that contract farming is one strategy for overcoming some of the limitations
of developing countries in terms of availability of agricultural services marketing, extension, input supply, financing and other support to smallholder farmers (Coulter et al, 1999). Contract farming can also help to integrate smallholders into commodity chains and allow access to appropriate technologies for improving their productivity. On the contracting firm’s side, contract farming is viewed as a solution to land problems. Most large tracts of suitable land are now either traditionally owned, costly to purchase or unavailable for commercial development. Contract farming, therefore, offers access to crop production from land that would not otherwise be available to a company, with the additional advantage that it does not have to purchase it.

However, Prowse (2012) highlights that the advantages of contract farming to farmers as well as to the firm is dependent on many factors including power relationships between the producers and the firm (notably, if the firm has a monopolistic position in the local market and if the producers are organised or not). For more than a decade in Tanzania, various crops have been produced using either formal or informal contracts. In recent years, the contract system has been emphasized more than ever before. For example, evaluations of pilot cotton contracting schemes indicate that they increase farmer productivity and incomes and have led the Cotton Board to recommend that contracting be implemented in all regions which grow cotton for the cropping season of 2011/2012 (Salm et al., 2011). Edicts from the government, including from the Prime Minister (PM), now emphasize the adoption of contract farming in the cotton industry. Recently, when opening the meeting of cotton stakeholders at the College of Central Bank in Mwanza, the PM
urged all leaders, including leaders of farmers’ organizations, to be in the forefront of promoting contract farming in the cotton industry (Habari leo of 6 July 2013 p.2).

1.2. Importance of contract farming in Tanzania

While contract farming for cotton is still at an early stage, it has been practiced in the sugar industry for more than a decade. Sugar, is an important industry within the agricultural sector in Tanzania. It employs between 14,000 and 15,000 people directly in the producing companies and institutions and about 66,000 people in cane production and secondary activities (SDC, 2001; URT and EC, 2005).

During the 1970s and 1980s, the sugar industry was fully under the control of the state. However, because of inefficiencies in their operations, the sugar milling companies were privatized as part of economic reform in the late 1990s (Mmari 2012). According to Matango (2006), Mtibwa and Kilombero sugar companies are two milling companies that were privatized and have well developed out-grower schemes defined as milling companies surrounded by well-organized growers who produce on their own land under contract.

1.3. Purpose of the study: problem statement and objectives

Despite privatization of the companies, smallholder farmers continue to contribute significantly to the production of sugarcane. However, various studies have indicated that sugarcane productivity in the out-grower schemes in Tanzania is very low compared to neighbouring countries like Malawi and Zambia (Mmari 2012).
The low productivity from out-grower schemes might be the reason why Tanzania has continued to be a net importer of sugar despite its sugarcane production potential. In 2012 Tanzania’s sugar consumption was estimated at 480,000 tonnes per annum but the production from four factories including Tanganyika Plantations Company (TPC), Kilombero, Kagera and Mtibwa sugar was only 320,000 tonnes, indicating a deficit of 160,000 tonnes per annum (SBT, 2012). In fact, for several years the country’s sugar production has been about two thirds of the total demand. The demand gap usually is covered by licensed imported sugar that has to arrive in the country when all factories have closed for maintenance or have less stock for sale. This importation cost the country approximately USD 132 million per annum (SBT, 2013).

Even though low productivity of sugar from out-grower schemes is reported from the Kilombero and Mtibwa sugar schemes, studies have indicated that the productivity is much lower in Mtibwa compared to Kilombero (Magongo 2008; Mmari 2012; Ngirwa 2011). For example in 2005/06 crop year, Mtibwa out-growers produced 259,962 tonnes from 10,390 hectares or 25 tonnes per hectare. Kilombero out-growers produced 481,187 tonnes from 11,826 hectares or 40 tonnes per hectare (Mmari 2012). The reasons for the poor productivity performance of the out-grower schemes, especially Mtibwa schemes, are not well known and provide one of the reasons for this study. The study is guided by the framework of commodity systems and the theory of diffusion of innovations.

Specifically, the study seeks to answer five main questions that include 1) How are growers organized in the sugarcane commodity chain? 2) What factors
influence growers to choose one contracting chain (farmer organization) over the other? 3) What are the perceptions of partially and fully integrated farmers regarding the advantages and disadvantages of contract farming? 4) What are the main areas of concern of grower participants in sugarcane production? 5) Do partially and fully integrated farmers differ in terms of their perceptions of the main areas of concern?

1.4. Importance of the study to development

This study is important because in Tanzania, contract farming is an increasingly important link in various commodity supply chains and mode of organization for agribusiness. In the sugar sector, contract farming is expected to expand because sugar has been identified as one of the three key commodities for the initial phase of the Government of Tanzania’s Southern Agricultural Growth Corridor of Tanzania (SAGCOT) project which will be implemented in Kilombero. Therefore, understanding the effectiveness and constraints of the contract system is important. It is envisioned that the results will help to inform the formulation of agricultural and rural development policies that promote a win-win situation among the contracting parties. Also, it is expected that the results will be useful to other rural development practitioners who are interested in promoting contract farming as a tool for rural development.
1.5. Sociological significance of study

The study has sociological significance as well. In Tanzania, contract farming is seen as a modern organizational arrangement for agri-food systems. It has been argued that the way contracts and the income earned from contracting is distributed within a rural community can have important implications for economic and social differentiation within that community (Key and Runsten 1999). These issues are also important in the Tanzanian context, particularly in out-grower schemes where there can be substantial inequality related to the distribution of income, human capital and productive assets such as land. Therefore, this study will contribute to an understanding of the socioeconomic impacts of contract farming including changes in growers’ organization and income. Also, the study sheds light on the issue of power relations between the buyer and out-growers and reveals potential structural and attitudinal differences between the two different groups of growers. Finally, the study extends the existing literature in commodity systems by analysing factors that influence growers to choose one grower organization over the other.
CHAPTER 2

LITERATURE REVIEW

This chapter reviews literature relevant to the study of contract farming. The chapter covers various concepts related to contract farming; theoretical perspectives of contract farming; advantages and disadvantages of contract farming and the role of farmers’ organization in contract farming. Additionally, the chapter highlights the role of off farm income and the location of the farm on the output of contract farming. The chapter concludes by providing the conceptual framework and hypotheses derived from the conceptual framework.

2.1. CONTRACT FARMING DEFINED AND DESCRIBED

2.1.1. Definition of contract farming

Different terms have been used to refer to contract farming. Some of the terms include core-satellite farming, nucleus estate and out-grower schemes. The terms are used interchangeably; however, some writers have tried to differentiate between them. For example, Glover (1984) differentiated between contract farming and out-grower schemes. He explained contract farming as a term used to identify schemes operated by private companies (both local and foreign) and out-grower schemes as those operated by parastatal organizations.
The Contract Farming Resource Centre (CFRC) defines contract farming (CF) as agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of farm products (CFRC, 2008). The agreement might also include access to technical assistance, production inputs and finance (Singh, 2005). Prowse (2012) described contract farming as a form of vertical integration within agricultural commodity chains that provides the firm with greater control over the production process as well as quantity, quality, characteristics and the timing of what is produced. He regarded contract farming as a new approach to conventional forms of vertical integration where the firm invested directly through large-scale estates or plantations. He further explained that with contract farming, the firm has a degree of control over the production process and product without necessarily entering directly into the production process.

2.1.2. Forms, models and typologies of contract farming

Contract farming can further be understood by highlighting the forms, models and typologies that have appeared in the literature. There are three common forms of sugarcane production organizations worldwide (Lone, 1989; and Abbort, 1990). The first is total integration where sugar mills own plantations and supply all the cane required for processing. The second is partial integration where sugar mills supply a portion of the cane required with the remaining portions being supplied by out-growers either on contract or on non-contract basis. The third form is that of total separation under which almost all of the cane required for processing is supplied by out-growers. The form of sugarcane production organization found at Mtibwa is
partial integration where out-growers supply some of the cane to the miller on contract basis.

The literature has cited five different models of contract farming. They include centralized model, nucleus-estate model, multipartite model, informal model and the intermediary model (Glover and Kusterer 1990; Eaton and Shepherd, 2001; Da Siva, 2005; Bijman, 2008 and Mansur et al, 2009). The centralized model involves a centralized processor and/or packer buying from a large number of small farmers. Farmer quotas are normally distributed at the beginning of each growing season and quality is tightly controlled. The centralized model is preferred for crops subject to stringent processing standards, require a high-level of experience from farmers, entail frequent changes in farm technology, and involve significant long-term investment (Eaton and Shepherd, 2001).

Glover and Kusterer (1990) indicate that the nucleus-estate model involves the firm owning and managing estate plantation with some contracted farmers. Eaton and Shepherd (2001) emphasize that this is the type of model that utilizes out growers from the central state.

The multipartite model involves more than two parties in the contract. It can develop from the centralized or nucleus estate models, through the organization of farmers into cooperatives or the involvement of a financial institution (Eaton and Shepherd, 2001).

The informal model is characterized by individual entrepreneurs or small companies and involves informal production contracts, usually on a seasonal basis. It
often requires government support services such as research and extension. Due to its non-formal nature, it often suffers from extra contractual side-marketing (Eaton and Shepherd, 2001).

The intermediary model involves the processor in subcontracting linkages with farmers or intermediaries. Some drawbacks to this model are that the processor may lose control of production and quality as well as prices received by farmers (Eaton and Shepherd, 2001).

Three main types of contracts with producers have been adopted in order for food processors to ensure effective supply chain management (Bijman 2008; Glover 1984; Prowse 2012). The first is the market specification contract where there is a pre-harvest agreement between producers and contractors on the condition governing the sale of the crop. Usually, time, sale location and the quality standards are specified and the contractor normally provides minimal material and technological input. Under this type of contract, the farmer maintains most of the decision rights over his farming activities and bears most of the risk of his most production activities. Contract farming in Mtibwa falls under this typology and therefore this study has focused more on the market specification contract.

The second typology is the production management contracts where the contractor has more control of the production processes compared to market specification contracts. The key aspect of this type of contract is that the producer agrees to precisely follow the production methods and adhere to the prescribed type and amount of required inputs.
The third type of contract is the resource provision contract. Under this contract the contractor agrees to provide key inputs but also can act as a market outlet for the produced commodity. The costs of inputs are recovered upon product delivery.

2.2. THEORETICAL PERSPECTIVE ON CONTRACT FARMING

2.2.1. The commodity systems framework

Various frameworks can be used to analyse contract farming systems. One of the frameworks relevant to agriculture and applied in that context by scholars in the sociology of agriculture tradition is the commodity systems analysis. With a theoretical foundation in world systems theory, the commodity systems framework dates back to 1977 when the term ‘commodity chain’ first appeared in the article by Torrence Hopkins and Immanuel Wallerstein to mean a network of labour and production processes whose end result is a finished commodity (Hopkins an Wallerstein, 1977; Hopkins and Wallerstein, 1986 and Bair, 2005). Bair (2005) explains that the most widely cited and influential framework in this field was that of Gereffi published in 1994 in “Commodity chain and global capitalism”. Gereffi’s framework has roots in both world systems theory and organizational sociology (Bair 2005). Gereffi described a commodity chain as the full set of actors that are involved in the production and distribution of a particular good or service and mapping the kind of relationships that exist among them (Gereffi, 1994).

The framework proposed by Friedland (1984) to be applied to agricultural commodity systems is particularly relevant to this study. Friedland’s (1984) paper
titled “Commodity systems Analysis: An approach to the Sociology of Agriculture” identified five basic foci that constitute a commodity systems approach including production practices, grower organization, labour as a factor in production, scientific production and application, and marketing and distribution systems. The analysis of production practices involves the ways in which production is organized and problems confronted during the production cycle. Grower or farmer organization entails how growers are organized in producing and supplying a particular commodity and the size and structure of the production units. Labour, as an element in the commodity system framework, deals with how labour is made available in various stages of commodity production. The scientific production and application aspect includes the relationship between the commodity organization and research and development units. The marketing and distribution networks focus on marketing of the commodity and the flow of capital through the various segments of production and distribution (Friedland, 1984 p. 223-226).

The commodity systems framework provides a number of helpful insights into the organization and consequences of how agricultural products are produced and circulated through a global system. For example, Friedland (1984) and Hopkins and Wallerstein (1986) argue that the commodity chain is a useful way to trace connections among complicated production and distribution systems and to organize information on processes that cross national boundaries. Watts and Goodman (1997) noted that the commodity chain framework avoids the grand generalities associated with discourses of development and globalization by focusing on distinct commodity specific or sectoral dynamics.
This study utilizes insights from the frameworks provided by Gereffi and Friedland to analyse linkages between the grower organization and the processor. Also, the study assesses the growers’ perceptions of the advantages and disadvantages of the contract system and its impact on incomes of out-growers. Even though the study analyses the grower organization as one element in the commodity systems, at some level other systems are involved. As noted by Friedland, no commodity system stands alone. At some level a relative distinctive system is linked and integrated with other systems (Friedland, 1984 p. 223).

2.2.2. The theory of diffusion of innovations

In addition to insights from the framework of commodity systems, the theory of diffusion of innovations provides useful insights to this study. Contract farming can be viewed as an organizational innovation adopted by out-growers. The theory has two distinct perspectives: adopter perspective by Rogers and infrastructure by Brown. Drawing from these perspectives, various factors have been identified as influencing the adoption and diffusion of innovations. The factors that have received significant attention are the characteristics of the innovation, including relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995 and Brown, 1981). Other factors considered include the communication channels and the type of the social system through which an innovation is diffused. Another factor is the characteristics of adopter which include income, education, land ownership, size of land and entrepreneurship skills (Rogers 1995).

In addition to the mentioned factors, Brown offered another perspective through which adoption and diffusion of innovations can be understood. The central
idea of his perspective is that the diffusion agency sets the attributes of the innovation and how adopters can acquire it. Influential variables that can be derived from Brown’s perspective include the location of an innovation relative to the adopter, coordination of distribution and the degree of centralized versus decentralized organizational control. Other variables suggested by this perspective include the cost of the innovation, infrastructure required to adopt it, targeted group and ways used to promote the innovation (Brown, 1981).

In various studies the two perspectives have either been applied independently or in combination. This study combines both perspectives based on the fact that both structural and non-structural factors influence participation and perceptions of contract farming. The combination of the two perspectives has enabled the use of the variables from both perspectives as shown in Fig. 1.

2.3. ADVANTAGES AND DISADVANTAGES OF CONTRACT FARMING

Globally, the role of contract farming in improving farmers’ livelihoods has been a topic of interest and controversy for at least the past four decades (Glover, 1984 and Minot, 1986). While some research findings recommend contract farming as a strategy to be adopted to improve farmers’ livelihoods (Miyata et al., 2009), others suggest the opposite and raise concerns about the “formal contract farming bandwagon” and interventions that integrate rural smallholders into more formal and commercial market systems (Costales and Catelo, 2009).
2.3.1. Advantages

Proponents of contract farming view it as a means to incorporate smallholder farmers into growing markets for processed goods and export commodities. They argue that under contract farming, smallholders are able to obtain reliable and improved agricultural extension services, credit, agricultural inputs and gain access to reliable markets for their produce (Minot, 2007). Also, contract farming can facilitate the introduction of appropriate technology (Silva, 2005) and business management skill transfer in the form of record keeping, efficient use of farm resources, and knowledge of product quality (Songsak and Wiboonpoongse, 2008).

2.3.2. Disadvantages

Criticis argue that contract farming favours resource endowed farmers and marginalizes resource poor farmers thereby exacerbating rural inequality (Simmons et al., 2005; Singh, 2002). Other critics argue that contract farming rarely encourages farmers to begin any value added activity like packaging and processing or marketing their own produce (De Schutter, 2011), and can lead to reduced food production if contracted cash crops displace food crops. However, Glover (1984) maintains that this does not usually occur if farmers are allowed to make their own decisions.

Other reported disadvantage of contract farming include farmers’ indebtedness and overreliance on advances, domination by monopolies, manipulation of quotas and quality specifications, unsuitable technology and crop incompatibility and increased risk (Silva, 2005).
Furthermore, a concern over power relations between smallholder vis-à-vis contractors has been documented in the literature. It is argued that smallholders face unequal relations and their bargaining power depends on the availability of alternative sources of livelihood that may provide a safety net against monopsony power of firms (Glover, 1990; Grosh, 1994 and Little, 1994). Reardon and Barrett (2000) maintain that contract farming displaces decision-making authority from the farmers to the downstream processor turning farmers into quasi-employees.

2.3.3. Other studies on contract farming

Other studies have taken a more neutral position. They report that whether contract farming is beneficial or not, depends on various factors because it is not the contract per se, which is harmful, but how it is implemented in a given context. Diversity in the type of firms, farmers, nature of contracts, crops and socio-economic environment play an important role in determining the effectiveness of the contract farming system. The way farmers perceive contract farming, and define their relationship with companies differs across cultures, markets and production systems (Asano-Tamanoi, 1988). Moving from theory to practice, it is logical to argue that contract farming works if its advantages outweigh the disadvantages for both agribusiness firms and farmers.

Even though findings suggest that there is no universal approach that guarantees success of contract farming, smallholders would be served better if they have access to collective action that can be achieved through their organizations.
Therefore, in the next section, the role of growers’ organization in contract farming is reviewed.

2.4. GROWER ORGANIZATIONS AND CONTRACT FARMING

Grower organization is an aspect of interest that has been noted by the commodity chain analysis (Friedland, 1984 pg. 224). Bijman and Wallin (2008) defined grower organization as an association, a society, a cooperative, a union, a federation or even a firm that has been established to promote the interest of the growers. The main goal of the grower organization is to provide services that support growers in their farming activities including the marketing of farm products. Therefore, the way growers (farmers) are organized has implications on how and the extent to which they can gain access to various agricultural services.

2.4.1. Types of grower organization

There are various types of grower organizations but two have been highlighted by Traxler and Unger (1994). The first type is a grower organization that has as its primary function economic activities. The second type is the grower organization that has as its primary function political activities.

Grower organizations with primarily economic functions can be divided into two categories. One category includes those organizations that are integrated forward into the commodity chain through processing and/or marketing farm products or that have integrated backward through purchasing and/or producing farm inputs. The other
category consists of organizations that centralize and coordinate the selling of farm products. Despite this categorization, Kolady et al (2008) and Sick (1999), noted that in developing countries many grower organizations play a multipurpose role by combining political, economic and social functions. They argue that the organizations provide inputs, credits and advocacy (Kolady et al., 2008 and Sick, 1999). In contract farming, the grower organizations perform the advocacy role by negotiating favourable terms with the contractor (Stessens, Gouet and Eekloo, 2004). Other roles performed by the organizations include organizing production, marketing, and acting as contractors (Stessens, Gouet and Eekloo, 2004). Also, growers’ organization can tackle the problem of contract default and the scale of operations (Coulter et al. 1999).

2.4.2. Factors which influence growers joining organizations

The application of diffusion of innovation models can be used to suggest factors that influence farmers joining grower organizations. The two perspectives used in this study was the adopter perspective pioneered by Rogers and the infrastructure perspective developed by Brown (Rogers, 1995 and Brown, 1981). Consistent with the work of Rogers (1995) and Brown (1981), factors that influence the joining of growers’ organizations can be grouped into two main groups: structural and non-structural factors. From Rogers’ perspective, important factors include age, gender, marital status, the income of the grower, level of education, land ownership, composition of the household, size of land owed and entrepreneurship skills (Arumugam et al., 2011 and Adong et al., 2013). From Brown’s perspective important factors include membership requirements, access to information, the location and infrastructure required to enroll (Adong et al., 2013).
2.5. THE ROLE OF OFF FARM INCOME AND LOCATION OF THE FARM IN CONTRACT FARMING

2.5.1. Off farm income

Off farm income can be defined as income derived from wage-paying activities and self-employment in commerce, manufacturing and other services. It is distinguished from on-farm income which is the income derived from diversification into different types of farming activities crops, livestock, and fishery.

It is said that in developing countries farming as a primary source of income has failed to guarantee sufficient livelihood for most farming households (Babatunde, 2012). Therefore, diversification into off farm activities has become a norm. However, engagement in off farm activities and income earned from the activities differ across farming households. Various studies have reported that education plays a major role in accessing better remunerated non-agricultural employment; people with low education have less access to more remunerative off-farm activities (Janvry and Sadoulet, 2001).

Although the majority of rural people are employed by agriculture sector in sub Saharan Africa, off farm income still plays a significant role. In some places, on average, off-farm income accounts for more than 50% of total household income (Janvry and Sadoulet, 2001). Even though the income earned from off farm activities is used to meet other household requirements, a significant amount is used to improve the performance of agriculture by providing farmers with cash to invest in productivity-enhancing inputs.
Due to the important role played by off farm income, it is not a surprise to find that farmers who have high output and efficiency are those whom agriculture is not their primary livelihood activity. In assessing the effect of off farm income diversification on agricultural production in rural Nigeria, Babatunde (2012) found that farm households with higher off farm income had higher agricultural output and expenditure on purchased inputs and a slightly high technical efficiency in agriculture.

2.5.2. Location of the farm

The distance of the farm from the collection centre or mill has important implications on the profit realized by contract farmers. The recommended distance depends on many factors including the perishability of the crop or animal product and the available infrastructure (e.g., cold room, transport and road). For example, in Kenya, a company called Kims Poultry Care Centre work with farmers within a radius of 60KM around Nakuru to ease logistical costs (Wainaina et al., 2012). In Tanzania, MSEL works with cane growers within a radius of 40KM around Turiani to reduce transportation costs (Matango, 2006).

2.6. THE CONCEPTUAL MODEL OF CONTRACT FARMING IN MTIBWA

The conceptual model for this study is informed by the commodity system analysis and the theory of diffusion of innovations. Friedland (1984) and Hopkins and Wallerstein (1986), noted that the commodity chain is a useful way to trace connections among complicated production and distribution systems and to organize
information on processes that cross national boundaries. This argument fits well with the sugarcane commodity chain at Mtibwa and consequently some variables included in the model have been derived from the five basic foci of the commodity systems. Other variables for example level of education, size of land, off-farm income are derived from Rodgers perspective of the theory of diffusion of innovation. The location of the farm as a variable in the model has been derived from Brown’s perspective of the theory of diffusion of innovations.

As it is indicated in Fig. 1, the model is parsed into two main parts; demographics are an independent variable in relation to the level of integration and the level of integration is an independent variable in relation to perceptions.

Figure 1: Conceptual model of Contract farming in Mtibwa: Factors Influencing the Perception of Contract Farming
2.6.1. Hypotheses

Drawing from the reviewed literature and in view of the above conceptual model, I expect fully integrated farmers to perceive contract farming as having more advantages compared to partially integrated farmers due to receiving full package of services offered under contract that include cane cutting, loading and transportation (Hypothesis # 1).

Also, I expect partially integrated farmers to perceive more disadvantages of the contract system than full integrated farmers due to not receiving full package of services offered under contract (Hypothesis # 2).
CHAPTER 3
METHODOLOGY

3.1. Introduction

This chapter describes the sampling method and data collection techniques used. Also, it describes the context of the study and the structure of farm organizations which is also part of answering my first research question related to understanding how contract farming is organized in the study area. The chapter concludes by providing a concise description of how variables were measured and the statistical analysis used.

3.2. Sampling method and data collection techniques

This study employed a multi-staged sampling procedure to select contract sugarcane farmers for interviewing in the wards of Diongoya and Mtibwa in Turiani division in Mvomero district. Despite the presence of sugarcane farms in all five wards of Turiani division, the majority of smallholder farmers who grow sugarcane live in Diongoya and Mtibwa wards. Therefore, the two wards were purposively selected based on having many sugarcane smallholder farmers. The selected wards had five villages each and two villages were randomly selected from each ward. From Diongoya ward, the villages selected were Manyinga and Lusanga and from Mtibwa ward the selected villages were Kidudwe and Lukenge. From each randomly selected village, a list of sugarcane growers was developed with the help of agricultural extension agents and leaders of out-grower organizations. This list of sugarcane
growers constituted the study population and a sample of 60 farmers who were fully integrated into contracts was randomly selected. Since there were few farmers who were partially integrated into contracts, purposive and snowball sampling methods were used to identify and interview 36 partially integrated farmers. Complete data was obtained from all but six farmers that were interviewed. Additionally, because of the method used to identify partially integrated farmers, some partially integrated farmers interviewed for this study fall outside the randomly selected villages.

Primary data were gathered through personal and key informant interviews. During the analysis it became important to get additional information about the local area or context of farming and that was obtained by telephone interviews with five key informants. Farmers were interviewed in their homes. The reliability of the interview schedule was improved by using four different procedures including an initial review of the study area, then calculation of Chronbach’s alpha, an internal consistency estimate of reliability for the Likert type items, followed by a pretest of the instrument and, finally administration of interview schedule. The intent of the review of the study area was to get a general understanding of the local area and learn how contract farming is organized. This step of the research helped the researcher to reconceptualise the study. In the initial conceptualization of this project, the researcher expected to interview contract and non-contract farmers. However, the initial investigation revealed that all farmers were contracted through their organizations and that the main difference between the two categories of farmers was the level to which they are engaged in the contract. Due to this finding, the terms
contract and non-contract farmers were abandoned and replaced with fully integrated (fully contracted) and partially integrated (partially contracted) farmers. Therefore, the examination of the study area allowed for modifications that helped to construct questions that were relevant to the context of the study area.

The Likert type items had a Chronbach’s alpha of 0.70 which according to Peterson (1994) is acceptable. Using multiple-items to measure psychological attributes is more desirable because individual items have considerable random measurement error. As such, measurement error averages out when individual scores are summed to obtain a total score (McIver and Carmines, 1981; Spector, 1992 and Nunnally and Bernstein, 1994).

The exercise of pretesting the instrument helped to refine the questions. Questions that were not well understood during pretesting were edited and some were removed from the instrument. Furthermore, it was revealed that farmers did not have information for some important questions. For example, the majority of farmers did not know the cost of cutting, loading and transportation of sugarcane. These costs become known to the farmers on the day they received their pay slips where the costs were shown as deductions. The information that was not obtained from farmers was obtained from key informants and offices of farmers’ organizations including Mtibwa out-grower association (MOA) and Turiani cane and other crop growers cooperative society LTD (TUCOCPRCOS LTD). Also, the reliability of the instrument was improved by training the two enumerators that were involved in data collection. During training, each question was clarified in order to make sure that all enumerators had a similar understanding of the questions. During training, it was planned to
involve all enumerators in both pretesting and administration of the interview schedule. However, one enumerator was not involved in the final data collection exercise and was replaced by another who then received similar training.

The second data collection method, the check list, was used to gather information from key informants (KI). The KI that were contacted included the human resource and operations manager of the Mtibwa Sugar Company, the ward executive officers from the two wards, the ward extension agent of Diongoya ward, the area coordinator of the European Union Sugar Project, the leader of out grower organizations (MOA and TUCORPCOS LTD) and the chairman of Turiani Savings and Credit Cooperative Society (TuriSACCOS).

The process of data collection began in February 2013 and ended in March of the same year. In terms of areas where respondents came from, 15 respondents were randomly selected from each selected village resulting in a total of 60 fully integrated farmers. For partially integrated farmers, 30 respondents came from five villages of Mtibwa ward and three villages of Diongoya ward. The villages of Mtibwa ward and the corresponding number of respondents in brackets are Madizini (eight), Lukenge (four), Kidudwe (one), Mlumbilo (four) and Kunke (five). The villages of Diongoya ward and the corresponding number of respondents are Lusanga (three), Manyinga (one) and kwa Dori (four).
3.3. CONTEXT OF THE STUDY AND THE STRUCTURE OF FARM ORGANIZATIONS

3.3.1 Sugarcane production and supply processes in Mtibwa

Sugarcane is a tall and relatively strong class of perennial grasses that are known to have high sugar content. In Mtibwa, production and supply of cane involves five basic steps: land clearing, cane planting, field maintenance, harvesting and haulage.

Out-growers clear land either by using family labour, casual labourers, hired tractor services or all three. Stem cutting is the most common reproduction method. Each cutting contains at least one bud, and the cuttings are hand planted.

Once planted, a stand (a new plant crop) can be harvested several times; after each harvest, the cane sends up new stalks, called ratoons. Successive harvests give decreasing yields, eventually justifying replanting. In other parts of the world experience shows that when the field is well maintained up to 10 harvests can be supported. However, out-growers in Mtibwa can harvest up to six times if fields were well maintained, there was good weather and livestock keepers did not graze their cattle into the fields. Otherwise, most out-growers harvested three times.

The process of cane harvesting (cane cutting), cane loading and transportation usually was organized by farmers’ organizations including MOA, TUCOCPRCOS and KIOMA group. Before harvesting, the field is set on fire. The fire burns dry leaves, and chases or kills any lurking venomous snakes, without harming the stalks and roots. After the field is set on fire, canes are supposed to reach the mill for processing within 48 hours. Therefore, casual laborers are organized before setting the
field on fire. After canes have been cut, a special machine called a grab loader loads the canes into the trucks which transport the cane to the cane yard. The service charge for cane cutting, loading and transportation is deducted from the farmers’ paycheck.

Sugarcane processing usually involves two basic steps. First, the sucrose is removed from the cellulose within the cane itself. This leaves the basic raw sugar. The second step involves running the raw sugar through a refining process, producing sugar products such as granulated or powdered sugar. At Mtibwa mill, sugar is not the only product of the cane. Other products derived from the processing include bagasse, molasses, and filter-cake.

3.3.2. Selling cane to Mtibwa Company

Farmers receive different prices depending on the quality of their cane, which is determined by the sucrose content of the cane. However, as it will be discussed later, determining the amount of sucrose in a particular farmers cane is a contentious matter. The technical term for the amount of sucrose is ‘rendement’ which is calculated based on how many tonnes of sugar can be obtained by crushing 100 tonnes of sugarcane. For example, a rendement of 11 implies 11 tonnes of sugar are produced after crushing 100 tonnes of sugarcane and the rendement of 10 implies 10 tonnes of sugar are obtained after crushing 100 tonnes of sugarcane and so on. In the context of Mtibwa, when the rendement falls below seven, usually the cane is not purchased by the factory.
3.3.3. Services provided to out-growers

Out-growers do benefit from services provided by various actors in the sugarcane commodity chain. The services provided include new technologies for example improved seeds, credit, production inputs (notably, inorganic fertilizer), rehabilitation of rural roads, cane cutting, loading and transportation. Actors that provided the services include farmer organizations, Savings and Credit Co-operative Society (SACCOS), banks, Mtibwa Sugar Estate Limited, donors, government and private companies. However, as it will be discussed in subsequent sections, farmer organizations were the main actors providing some of these services. The main services provided by the farmer organizations are cane cutting, loading and transportation. The other services include facilitating access to credit by acting as guarantors for out-growers to get credit from SACCOS and banks. Also, farmer organizations organize acquisition of agricultural inputs and rehabilitate rural roads.

Extension services, the only services provided for free to out-growers, were provided by the government in collaboration with donors. It was noted that about seven government extension agents were seconded to European Union Sugar Development Project to provide extension services to out-growers. These extension agents continue to be paid by the government, the project facilitate them with transport in order to reach many out-growers. It was also noted that some farmers buy new improved sugarcane varieties from Mtibwa Sugar Estate Limited.
3.3.4. Organization of contract farming in Mtibwa

Mtibwa Sugar Estate Ltd. (MSE) is located in Turiani Division in Mvomero district, 102 km north of Morogoro town and 290 km from Dar-es-Salaam. The company is said to be owned by a consortium of Tanzanian business persons. However, cane growers, have varying views about the owners of the company. The majority tend to believe that it is owned by some people who were holding higher political positions when the company was privatized in the late 1990s. The main activities of the company were sugarcane growing and the production of sugar and related products. Cane is supplied from the company’s own fields and some small portion from small out-growers in surrounding villages. Part of the sugar produced is exported to the EU under the Sugar Protocol while the remaining is sold locally.

Even though Turiani division has 28 villages, only 18 villages were involved in growing sugarcane. MSEL contracts smallholder farmers through three farmers’ organizations that are present in the area. These organizations include Mtibwa Outgrower Associations (MOA), Turiani Cane and other Crop growers Cooperative Society LTD (TUCOCPRCOS) and a private company known as KIOMA which is owned by a group of fairly big farmers from Turiani. As explained before, cane growers were divided into two groups, fully and partially integrated farmers (also referred to as fully and partially contracted farmers). These two groups have different characteristics including the way they gain access to market their sugarcane.

With regard to selling sugarcane the main distinguishing feature between the groups of growers is that fully integrated farmers sell their canes through MOA,
TUCOCPRICOS, or partially integrated farmers. With regard to partially integrated farmers, in addition to selling their canes through MOA and TUCOCPRICOS they also sell through KIOMA, a private company that provides sugarcane services. The next section provides more details of this distinguishing feature.

3.3.5. Fully integrated farmers

Some fully integrated farmers were registered in more than one farmer organizations and a single household may sell their sugarcane through more than one organization. The decision of a single household registering in a particular organization is influenced mainly by the location of the farm. If the household has more than one farm located in different places, it may register with different organizations in order to increase the chance of getting the services of cane cutting, loading and transportations that are provided in different locations on a quota basis. These services were seen by growers as the main services provided by their organizations. It is important to note that the constitutions of farmers’ organization do not allow a farmer to be a member of more than one organization. Therefore, farmers overcome this limitation by a husband and spouse joining different farmers’ organizations.

As indicated in fig. 2 fully integrated farmers also sell their cane to some partially integrated farmers who finally deliver the canes to the firm. This usually happens when the fully integrated farmers anticipate delays in getting paid by the company. They sell their cane to partially integrated farmers who seem to have more resources compared to fully integrators. During interviews with extension workers and leaders
of farmers’ organizations, it was pointed out that even though full integrators receive low price when they sell their cane to partial integrators, they receive immediate and timely cash payments. This enables them to weed and buy fertilizers for their farms that increase the productivity of the ratoon crop or new stand for the following year.

**Figure 2: Contracting chain for fully and partially integrated farmers**

![Diagram](image)

**Fig. 2: Contracting chain for fully and partially integrated farmers**

Furthermore, when fully integrated farmers sell cane to partially integrated farmers, they avoid many deductions. When they sell through MOA or TUCOCPRCOS deductions appear on the final pay slip for cane cutting, cane transport, grab loading, MOA or TUCOCPRICOS levy, fuel stock, Tanzania Sugarcane Growers Association (TASGA), infrastructure, out-grower (OG) services and District Council Levy.
In order to get a clearer picture of how much was deducted for each aspect, farmers were asked to avail their pay slips to the researcher. Below is an example of the pay slip of one farmer which shows specific details.

- Area planted = 1 acre
- Total tons sold = 25.18 tons
- Rendement (percentage of sucrose) = 10.1%
- Rate per ton = 38,720 Tsh (USD 24.50)
- Gross income = 974,974.35 Tsh (USD 617.07)

**Deductions**

- Cane cutting = 100,720 Tsh (USD 63.74)
- Grab loading = 75,540 Tsh (USD 47.81)
- MOA levy = 8,813 Tsh (USD 5.58)
- Fuel stock = 6,295 Tsh (USD 3.98)
- TASGA = 2,518 Tsh (USD 1.59)
- Infrastructure = 21,403 Tsh (USD 13.55)
- OG services = 10,072 Tsh (USD 6.37)
- Cane transport = 191,398.72 Tsh (USD 121.14)
- District council levy = 15,599.59 Tsh (USD 9.87)

Total deductions = 432,359 Tsh (USD 273.64)
Invoice total = 542,615.35Tsh (USD 343.43)

To know exactly how much the farmer gets, one should also consider costs that are not reflected on the payslip. These costs; include labour costs (farm preparation, planting and weeding), fertilizer, pesticides and seeds. The following calculations show estimation of these costs based on two scenarios

First scenario: A stand (a new plant crop)

Farm preparation: hiring tractor 1 acre = 40,000Tsh (USD 25.32)

- Planting: 1 acre = 58,000Tsh (USD 36.71)
- Buying seed: 1 acre = 580,000Tsh (USD 1,580)
- First weeding: 1 acre = 58,000Tsh (USD 36.71)
- Second weeding: 1 acre = 100,000Tsh (USD 63.29)
- Pesticides: 1 acre = 12,000Tsh (USD 7.59)
- Inorganic fertilizer: The farmer did not use inorganic fertilizer
- Total cost not reflected on payslip = 848,000 (USD 536.71)
- Invoice total minus Cost not reflected on payslip

= 542,615.35Tsh (USD 343.43) - 848,000 (USD 536.71) = -305,384.65Tsh (USD -193.28)

The above calculations show that the grower will get a loss of -305,384.65Tsh (USD -193.28) if it is a new plant crop.

The results of the first scenario concur with the explanation given by the operations and human resource Manager of MSEL when he was asked whether farmers make a profit in all harvesting seasons. He explained that for a stand (new
plant crop), usually production costs are higher compared to what farmers get. However, he mentioned that for a ratoon crop, some farmers can get a profit of more than 100% if fields were well maintained. The following second scenario shows estimated cost and benefit for a ratoon crop.

*Second scenario: A ratoon crop*

For a ratoon crop, the farmer does not incur costs for farm preparation, planting and seed. For this case when these costs equivalent to 678,000Tsh (USD 367.09) are not incurred, the invoice total would be 372,615.35 (USD 235.83) per acre.

### 3.3.6. Partially integrated farmers

Partially integrated farmers, sell their cane through MOA and TUCOCPRICOS and KIOMA, a private company that provides sugarcane services. However, it was explained by key informants that only a few farmers sell through this company. Despite being members of farmer’s organizations, partially integrated farmers usually do not rely on farmers’ organizations for cane cutting, loading and transportation services. Being members of an organization only facilitates the delivery of their cane to the mill because the mill will not receive cane from individual growers. The grower is required to deliver cane through the organization in which they are a member. Partially integrated farmers usually do not receive the services of cane cutting, loading and transportations. Thus, deductions for these services depend on whether the grower received the services from farmers’ organizations.
3.3.7. Sugar commodity chain at Mtibwa

The organization of contract farming at Mtibwa can be further understood by visual diagraming the sugar commodity chain as indicated in figure 3. It shows various actors at various nodes (notably production, harvesting, processing and marketing). Also, the figure shows activities undertaken at the respective nodes.

Figure 3: Commodity chain of cane in Mtibwa
3.4. MEASUREMENT MODEL

To test the hypothesis, I conducted descriptive and bivariate comparisons using Chi-square analysis as a measure of association between perceptions and fully and partially integrated growers. In this section I describe how the dependent and independent variables were operationalized and used in my conceptual framework.

3.4.1. DEPENDENT VARIABLE

Perception of contract farming

Favourable perceptions of contract farming were measured using a set of questions that assessed the advantages obtained from services provided or by joining contract farming that were then combined into an index. The services or advantages obtained included access to extension, new technologies, credit, reliable market, production inputs (notably, fertilizer and seeds), rehabilitation of local infrastructure (rural roads), and transportation and timely delivery of cane to the mill. Descriptive statistics for the individual and summated measures are reported in Chapter 4.

Unfavourable perceptions were measured using an index of anticipated disadvantages or risks that may occur by joining contract farming. The disadvantages include, loss of freedom pertaining to farm management decisions, food insecurity, indebtedness, and rejection of sugarcane due to not meeting required standards.
3.4.2. INDEPENDENT VARIABLES

Level of integration

The level of integration was defined as the extent to which growers are engaged in contract farming. Growers who receive the whole package of cane cutting, loading and transportation were termed as fully integrated farmers and those who only have a contract for selling cane to MSEL were referred to as partially integrated farmers.

Location of the farm

The location of the farm was measured as the distance in kilometres from where the farm is located to the collection centre or the mill. The existing categorization used by farmers was adopted. Farmers were asked to select a response category indicating the distance from their fields to the collection centre or the mill as follow i) 1 – 10 KM, ii) 11 – 20 KM iii) 21 – 30 KM and iv) 30 – 40 KM.

Farmer organization

Farmer organizations act as intermediaries through which growers are contracted. Farmers were requested to choose an organization in which they were registered as members. Three response categories were provided; MOA, TUCOPRCOS and KIOMA.

Off farm income

Off farm income was defined as income derived from wage-paying activities or self-employment in commerce, manufacturing and other services. It was measured by asking respondents to select one response category which shows their off farm income
per month. Four response categories were provided as follow i) 0 – 99,000Tsh per
month ii) 100,000 – 199,000Tsh per month iii) 200,000 -299,000Tsh per month and
iv) 300,000Tshk; and above per month. Based on the government salary structure
which is 200,000Tsh per month for employee with the lowest rank, it was decided that
responds with off farm income less than 200,000Tsh per month have low off income
and those with off farm income of 200,000Tsh per month and above have higher off
farm income.

Areas of disagreement

The influence of potential areas of disagreement on perceptions of contract farming
was measured as an index score of four Likert scaled statements. The four sentences
representing areas of disagreement are: 1) After selling sugarcane to MSEL, you
receive the payment on time 2) During harvesting season, quotas are manipulated 3)
There is transparency in determination of sugar content (rendement) 4) There is
transparency in determining the weight of sugarcane.

3.5. DATA ANALYSIS

3.5.1. Quantitative data

Quantitative data for this thesis was analysed using the statistical software package
SPSS 20.0.

3.5.2. Qualitative data

Qualitative data was analysed using content analysis method as follow:
First step: Read through all the data from key informants. Second step: Organizing information into similar categories or themes such as advantages of contract farming disadvantages of contract farming and suggestions for improving contract farming

Third step: Label the categories or themes such as advantages, disadvantages and suggestions for improvement

Fourth step: Identifying patterns in the themes, for example, all leaders of farmer organizations had positive or negative perception with contract farming; all extension workers had negative or positive perception with contract farming
CHAPTER 4

RESULTS AND DISCUSSION

4.1. Introduction

This section is organized into two main sections. The first section presents the descriptive analyses of the partially and fully integrated farmers. The second section report results of the hypotheses tested.

4.2. DESCRIPTIVE INFORMATION

4.2.1. Sex and level of education

As indicated in Table 1, women constituted 51.1% and men 48.9% of those interviewed. One reason for more women being interviewed was that the sampling process identified households and women were more likely to be at home when interviewers contacted these households. Women’s role in agricultural production in sub-Saharan Africa has been well documented (Bryson, 1981) and this is also true with cane production. Depending on the household, the role of women in contract farming runs the gamut from contributing to production and labor decisions to being the registrant in farm organizations particularly for households registered with two farmer organizations. Thus women were able to provide the information needed on the advantages and disadvantages of contracting. Information on cane selling which
many farmers did not remember was extracted from the payslips availed to the researcher.

Level of education is an important variable noted by the theory of adoption. In this study education influences the level of integration through the off farm income. As indicated in Table 1, a majority of the farmers interviewed (71.1%) attended only primary school and very few had any post primary education (20%). Also the results showed that nearly 9% of the respondents had no formal education. The remainder had either ordinary or technical education.

**Table 1: Sex and level of education**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>48.9</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>51.1</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>8</td>
<td>8.9</td>
</tr>
<tr>
<td>Primary</td>
<td>64</td>
<td>71.1</td>
</tr>
<tr>
<td>Ordinary (F1 - F4)</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td>Technical/College</td>
<td>6</td>
<td>6.7</td>
</tr>
<tr>
<td>University</td>
<td>1</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: Survey 2013

**Cross tabulation of level of education of partially and fully integrated farmers**

The results of a cross tabulation between educational attainment and level of farmer integration are reported in Table 2. The results indicate that partially integrated farmers had higher educational levels than fully integrated farmers. Very few (5%) fully integrated farmers had education beyond primary education compared to about 50% of partially integrated farmers who had education beyond primary level. The
difference in level of education between two groups of farmers was significant at p < .01.

Table 2: Cross tabulation of level of education

<table>
<thead>
<tr>
<th>Highest level of education</th>
<th>Partially integrated</th>
<th>Fully integrated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2 (6.7)</td>
<td>6 (10)</td>
<td>8</td>
</tr>
<tr>
<td>Primary</td>
<td>13 (43)</td>
<td>51 (85)</td>
<td>64</td>
</tr>
<tr>
<td>Ordinary (F1 - F4)</td>
<td>10 (33.3)</td>
<td>1 (1.7)</td>
<td>11</td>
</tr>
<tr>
<td>Technical/College</td>
<td>4 (13.3)</td>
<td>2 (3.3)</td>
<td>6</td>
</tr>
<tr>
<td>University</td>
<td>1 (3.3)</td>
<td>0 (0)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>60 (100)</td>
<td>90</td>
</tr>
</tbody>
</table>

Pearson Chi-square = 26.54, p = 0.000
Source: Survey 2013

4.2.2. Estimated off farm income of partially and fully integrated farmers

Results of Table 3 indicate that partially integrated farmers have higher off farm income compared to fully integrated farmers. About 33% of partially integrated farmers had income below 299,000Tsh compared to 72% of fully integrated. Also about 67% of partially integrated farmers had income of 300,000Tsh and above compared to 28% of fully integrated. The difference in income between the two groups of farmers was significant at p < .01. This difference is attributable to the difference in the level of education. As it has been reported in the previous sections, partially integrated farmers have higher level of education compared to fully integrate. Higher level of education is associated with accessing more remunerative off-farm activities (Janvry and Sadoulet, 2001).
Table 3: Cross tabulation between off farm income and category of the farmer

<table>
<thead>
<tr>
<th>Estimated off farm income</th>
<th>Partially integrated</th>
<th>Fully integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 30</td>
<td>5 (16.7%)</td>
<td>20 (33.3%)</td>
</tr>
<tr>
<td>0 to 99000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100,000 to 199,000</td>
<td>5 (16.7%)</td>
<td>23 (38.3%)</td>
</tr>
<tr>
<td>200,000 to 299,000</td>
<td>11 (36.7%)</td>
<td>13 (21.7%)</td>
</tr>
<tr>
<td>300,000 and above</td>
<td>9 (30.0%)</td>
<td>4 (6.7%)</td>
</tr>
</tbody>
</table>

Pearson Chi-Square 14.24; p = .003

4.2.3. Land Information

Information on land holdings was collected using acres to determine the amount of land operated, the amount of land owned and the amount of land rented. The results shown in Table 4 indicate that the mean acreage of land operated by partially integrated farmers was 28.7 acres while for fully integrated farmers the mean acreage was 7.43 acres. Also, partially integrated farmers owned more land compared to fully integrated farmers. The mean acreage owned by the partially integrated farmers was 26.87 acres while for the fully integrated farmers the mean acreage was 4.80 acres. This difference between land operated and land owned was statistically significant at p < .01. There was no significant difference in the amount of land rented between partially and fully integrated farmers.
Table 4: Land information (in acres)

<table>
<thead>
<tr>
<th>Land information</th>
<th>Mean (St. Dev.) Partial integrated</th>
<th>Mean (St. Dev.) Full integrated</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land in sugarcane</td>
<td>28.70 (17.31)</td>
<td>7.43 (13.91)</td>
<td>6.291***</td>
</tr>
<tr>
<td>Land owned</td>
<td>26.87 (15.45)</td>
<td>4.80 (4.61)</td>
<td>10.243***</td>
</tr>
<tr>
<td>Land rented</td>
<td>1.83 (5.94)</td>
<td>.33 (1.41)</td>
<td>1.863</td>
</tr>
</tbody>
</table>

***T-test significant level at .01

4.2.4. Membership in farmers’ organizations

Farmers in Mtibwa are organized in different organizations that facilitate horizontal linkages and offer other important advantages. The study found that a majority (56.7%) of partially integrated farmers were registered members of MOA and over 1/3 of fully integrated farmers (36.7%) were as well. The reason for higher percentage of membership in MOA will be explained in the next sub section that will explore the reasons for joining different organizations. Another noticeable difference in membership was that a large proportion of fully integrated farmers (35%) were registered in TUCOCPRICOS LTD compared to only 20% of partially integrated farmers. Furthermore, the results showed that many fully integrated farmers had multiple memberships compared to partially integrated farmers. The interviews revealed that one reason given for having multiple memberships was that it would increase the opportunity of obtaining cane cutting, loading and transportation services. Finally, none of fully integrated farmers were registered as a member of KIOMA group and only a small proportion (6.7%) of partially integrated farmers were members of KIOMA. This is because the KIOMA group is a registered private company. The difference in farmer organization registration was statistically significant at p < .05.
Table 5: Membership in farmers’ organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Partially integrated (N = 30)</th>
<th>Fully integrated (N = 60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOA</td>
<td>17 (56.7)</td>
<td>22 (36.7)</td>
</tr>
<tr>
<td>TUCOCPRCOS LTD</td>
<td>6 (20)</td>
<td>21 (35)</td>
</tr>
<tr>
<td>MAO and TUCOCPRCOS LTD</td>
<td>5 (16.7)</td>
<td>17 (28.3)</td>
</tr>
<tr>
<td>KIOMA</td>
<td>2 (6.7)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Chi-square = 8.46; p = .037

Source: Survey 2013

4.2.5. Factors that influence registration in farmer organization

After asking whether a farmer was a member of a particular farmer organization, a follow up question was asked to explore factors that influenced farmer’s choice to register in a particular organization. It is important to note that it is a requirement for every sugarcane farmer to be a member of a recognized farmers’ organization in order to sell cane to Mtibwa Sugar Estate Ltd. Therefore, this section explores factors that influenced sugarcane farmers to register in one organization over the other.

The identified factors were categorized into two main groups; structural and non-structural factors. As indicated in Table 6 the results showed that the three most important factors reported for joining the MOA were: because it was the first organization to be established (30.8%); this organization is strong and works for the interests of smallholder farmers (33.3%) and this organization operates in the village of the respondent (33.3%). The factor of registering with a certain organization because it operates in the village of the respondent was also a major reason why the majority of farmers (74.1%) joined TUCOCPRCOS. Registration with a certain
organization because it operates near one’s sugarcane field was a major reason why many farmers had multiple memberships (77.3%). Some partially integrated farmers had their cane fields located in areas where farmer organizations were predominant. It was also noted that membership in KIOMA Group Company was not open and was limited to founders only. These results are consistent with Brown’s perspective which describes the role of location of an innovation relative to the adopter. In this case, it can be implied that in villages where farmer organizations are not present, logistics of cutting cane cutting, loading and transportation would be difficult hence no growers will be engaged into contract farming. This claim is supported by the explanation from the key informants who pointed out that a cane grower whose cane field is located outside of the 40KM radius, cannot access the services offered by the farmer organizations.
Table 6: Factors influencing the membership in different organizations

<table>
<thead>
<tr>
<th>Reasons</th>
<th>MOA (N = 39)</th>
<th>TUCOCPRCOS (N = 27)</th>
<th>MAO and TUCOCPRCOS (N =22)</th>
<th>KIOMA (N = 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is predominant in my area (village)</td>
<td>13 (33.3)</td>
<td>20 (74.1)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Predominant where my sugarcane field is located</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>17 (77.3)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td><strong>Non-structural factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It was the first organization</td>
<td>12 (30.8)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>It works for the interest of smallholder farmers</td>
<td>13 (33.3)</td>
<td>5 (18.5)</td>
<td>1(4.5)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Transparent than other organizations</td>
<td>0 (0.0)</td>
<td>2 (7.4)</td>
<td>2 (9.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>There are strict conditions to join other</td>
<td>1(2.6)</td>
<td>0 (0.0)</td>
<td>2 (9.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>organizations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is our company</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>2 (100)</td>
</tr>
</tbody>
</table>

Source: Survey 2013

4.2.6. Benefits gained in different organization

As mentioned in the previous sections, cane growers are organized into different grower organizations. These organizations (in this study also referred to as a contracting chain) act as intermediaries which link cane growers to MSEL. Of interest to this research was to gain an understanding of whether farmers get different benefits depending on the contracting chain in which they are part. To answer this question, farmers were asked to mention the benefits which they received being members of their respective organizations.

The results show that the services of cutting cane, loading and transportation were provided by all organizations and were consistently reported as an important
benefit by about a third of the farmer participants within each organization. The other services provided by the organizations included facilitation of getting credit, delivering information related to sugar production and marketing to their members, advocacy and lobbying for good prices for sugarcane and empowerment through various training programs. The results showed that there was no statistically significant difference in benefits realized by farmer organizational membership implying that there was not a particular pattern of a grower organization providing superior benefits compared to the others.

Table 7: Benefits gained in different organization (%)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>MOA N = 39</th>
<th>TUCOCPRC OS N = 27</th>
<th>MAO and TUCOCPRCOS N = 22</th>
<th>KIOMA N = 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy and lobby for good price for sugarcane</td>
<td>6 (15.4)</td>
<td>1 (3.7)</td>
<td>6 (27.3)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Get services of cane cutting, loading and transportation</td>
<td>14 (35.9)</td>
<td>9 (33.3)</td>
<td>7 (31.8)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Facilitate getting credit</td>
<td>7 (17.9)</td>
<td>7 (25.9)</td>
<td>6 (27.3)</td>
<td>2 (100.0)</td>
</tr>
<tr>
<td>Facilitate to getting information related to sugarcane production and marketing</td>
<td>9 (23.1)</td>
<td>6 (22.2)</td>
<td>2 (9.1)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Empowerment through various trainings</td>
<td>3 (7.7)</td>
<td>4 (14.8)</td>
<td>1 (4.5)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

Chi-square = 14.97; p = .243
Source: Survey 2013

4.3. HYPOTHESIS TESTING

4.3.1. Perceived advantages of contract farming by individual farmers

This section discusses the perceived advantages of contract farming to individual farmers. The impact of contract farming was divided into two groups;
positive and negative impact. This kind of grouping led to the formulation of two research hypotheses. It was expected that fully integrated farmers might perceive contract farming to be more advantageous compared to partially integrated farmers. Also, it was expected that partially integrated farmers might perceive more disadvantages of the contract system than fully integrated farmers.

The positive impact (also referred to as advantages of contracting farming in this thesis) was measured using eight items. The perceptions of the two groups of farmers were compared using individual items and the index score (combined items). The items captured the following themes: accessibility of extension services, accessibility of credit, reliability of markets, adoption of new sugarcane production technologies, accessibility of production inputs (notably inorganic fertilizer), timely delivery of cane to the mill, improved local infrastructure (rural roads) and reduced transportation costs. To test the hypothesis, eight Likert-type items were developed and respondents were required to specify their level of disagreement or agreement on a five-point scale ranging from strongly disagree to strongly agree scale for a series of statements.

Table 8 reports the perceptions of the two groups of farmers on the advantages of contract farming. The numbers in parentheses indicate the standard deviations of the means. The results showed that both partially and fully integrated farmers had favourable perceptions of three items including extension services, adoption of new technologies and reliable market. They perceived that contract farming improved accessibility to extension services (the mean was 3.30 for partially integrated and 3.13 for fully integrated farmers). They perceived that contract farming helped them to adopt new technologies of sugarcane production (the mean was 3.63 for partially
integrated and 3.13 for fully integrated farmers). The two groups of farmers also perceived contract farming as having enabled them to obtain access to reliable markets for their sugarcane (the mean for partially integrated was 3.60 and that of fully integrated was 3.10). However, mean differences between the two groups of farmers on these three items were not statistically significant.

As indicated in Table 8, the two groups of farmers had different perceptions on all remaining items including accessibility of credit, availability of production inputs, improvement of local infrastructure, and reduction of transportation and timely delivery of cane to the mill. Partially integrated farmers had favourable perceptions while fully integrated farmers had unfavourable perceptions on the five remaining items. The differences were statistically significant at p<.01 except for availability of inputs. This analysis indicates that partially and fully integrated farmers have some important perceptual differences of benefits of contracting.
Table 8: Perceptions of advantages of contract farming on individual items

<table>
<thead>
<tr>
<th>Advantage of contract farming</th>
<th>Partially integrated</th>
<th>Fully integrated</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>With contract farming accessibility of advice from extension agent is easy</td>
<td>3.30(1.32)</td>
<td>3.13 (1.20)</td>
<td>0.601</td>
</tr>
<tr>
<td>Contract farming has enabled you to adopt new technologies of sugarcane production</td>
<td>3.63 (1.38)</td>
<td>3.13(1.20)</td>
<td>1.773</td>
</tr>
<tr>
<td>Contract farming has enabled you to get reliable market of sugarcane</td>
<td>3.60(1.16)</td>
<td>3.10 (1.32)</td>
<td>1.757</td>
</tr>
<tr>
<td>If you grow sugarcane under contract it is easy to get credit</td>
<td>3.43 (1.17)</td>
<td>2.58 (1.22)</td>
<td>3.153**</td>
</tr>
<tr>
<td>With contract farming, sugarcane production inputs are readily available</td>
<td>3.60 (1.50)</td>
<td>2.68(1.30)</td>
<td>0.692</td>
</tr>
<tr>
<td>Contract farming has improved local infrastructure like rural roads</td>
<td>3.93(1.17)</td>
<td>2.47(1.43)</td>
<td>5.186**</td>
</tr>
<tr>
<td>Contract farming arrangement has lowered transport costs of our sugarcane</td>
<td>3.67 (1.27)</td>
<td>1.97(1.13)</td>
<td>6.441**</td>
</tr>
<tr>
<td>Contract farming has improved timeliness in delivery of sugarcane to the mill</td>
<td>4.17 (.87)</td>
<td>1.80(1.07)</td>
<td>10.479**</td>
</tr>
</tbody>
</table>

Source: Survey 2013

T-test** Significant at .01 level

After analysing the differences in perceptions of individual items, all the items were combined to form an index score. The result in Table 9 shows that partially integrated farmers had positive perceptions of contract farming with the mean of 3.52 and standard deviation of 0.533. The index score shows that fully integrated farmers had negative perception of contract farming; the mean perception for fully integrated farmers was 2.61 with a standard deviation of 0.531. This difference in perceptions was significant at p < .01. These results are inconsistent with the hypothesized relationship and lead to a rejection of the hypothesis that fully integrated farmers perceive contract farming to be more advantageous than partially integrated farmers.
These results are akin to the findings of Manorom et al (2011) conducted in Lao People’s Democratic Republic; in this study, overall, it was found that the least satisfied farmers in terms of their reported profits were those with the most strongly structured agreements and the most satisfied farmers were the noncontract farmers (i.e. farmers who have not had contracts in the last two years). The negative perceptions of fully integrated farmers toward contract farming at Mtibwa, may be associated with disagreement along the sugar commodity chain that will be discussed in details under the section of areas of disagreement in the subsequent section. As it will be shown, fully integrated farmers were least satisfied with some practices that determine the profitability of contract farming.

Table 9: Index Score of perceptions of the advantages of contract farming

<table>
<thead>
<tr>
<th></th>
<th>Mean (St. Dev.)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial integrated</td>
<td>3.53 (0.54)</td>
<td></td>
</tr>
<tr>
<td>(N = 30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full integrated</td>
<td>2.61 (0.53)</td>
<td>7.71**</td>
</tr>
<tr>
<td>(N = 60)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey 2013
T-test** Significant at .01 level

4.3.2. Perceived disadvantages of contract farming by individual farmers

This section discusses the perceived disadvantages of contract farming using individual farmers’ perceptions of four areas including decisions on farm management, impact on food security, effect on the level of debt and need for meeting the required standards. The results showed that both partially and fully integrated farmers were not denied freedom on decisions pertaining to farm management. The mean for partial integrators was 1.73 with a standard deviation of .785 and that of full integrators was 1.63 with the standard deviation of 1.073. These results agree with
explanations given by the key informants and observations made during field visits. Key informants stated that the MSEL Company does not interfere with their farm management decisions; this is a feature of marketing contract under which sugarcane contract farming at Mtibwa fall. Also, some farmers interviewed while in their fields, where it was evident that farmers were allowed to intercrop cane with maize indicating another clear example of non-interference in farmer decision making.

With regard to impact of contract farming on food security, the results showed that both partially and fully integrated farmers agreed that contract farming has impacted negatively their food security. The mean for partial integrators was 3.20 and that of fully integrators was 3.37. However, the difference in perception between the two groups of farmers was not significant. When probed on how contract farming affected their food security, both key the informants and farmers explained that sugarcane compete with rice in terms of land. One farmer put it well by saying

“Ingawa hatuzuiliwi kupanda mpunga, tunalazimika kupanda miwa kwa sababu tukipanda mpunga ndege na wanyama wanaojificha kwenye mashamba ya miwa wanakula mpunga na hutuvuni” meaning that “although it is a farmers’ decision to grow sugarcane or rice, farmers are forced to grow sugarcane because when they grow rice, birds and other pests harboured in the cane fields feed on the rice and therefore they don’t harvest”.

With regard to contract farming leading to indebtedness, both partially and fully integrated farmers perceived that contract farming has increased their indebtedness. The mean perception for partial integrators on a five scale was 3.93 and the mean was 3.77 for full integrators.
Even though the mean difference in perception between partial and full integrators was not significant, key informants noted that indebtedness is not caused by the contract but to a greater extent is related to failure to harvest which leads to failure to repay the advances received from various money lenders. Failure to harvest is influenced by many factors including drought, livestock keepers grazing in sugarcane fields and failure to adhere to recommended agronomic practices like weeding and fertilizer application. Also, limited adherence to recommended agronomic practices is partially associated with financial constraint which is associated with delayed payments.

The two groups of growers differed in their perceptions of MSEL rejecting cane because of not meeting the required standard. The partially integrated farmers generally did not agree with the statement that their sugarcane is rejected while the full integrators agreed that during some seasons their harvested sugarcane is rejected because it does not meet the required standard. However, the difference in means between the two groups was not statistically significant.

Table 10: Perceptions of disadvantages of contract farming

<table>
<thead>
<tr>
<th>Disadvantage of contract farming</th>
<th>Mean (St. Dev.)</th>
<th>Partially integrated</th>
<th>Fully integrated</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract farming denies you freedom on farm management decisions</td>
<td>1.73 (.79)</td>
<td>1.63 (1.07)</td>
<td></td>
<td>.453</td>
</tr>
<tr>
<td>Contract farming has negatively impacted your food security</td>
<td>3.20 (.96)</td>
<td>3.37 (1.22)</td>
<td></td>
<td>.707</td>
</tr>
<tr>
<td>You are indebted because of sugarcane production problems</td>
<td>3.93 (.52)</td>
<td>3.77 (1.20)</td>
<td></td>
<td>.918</td>
</tr>
<tr>
<td>In some harvesting seasons your sugarcane has been rejected by not meeting required standards</td>
<td>2.93 (1.41)</td>
<td>3.27 (1.43)</td>
<td></td>
<td>1.049</td>
</tr>
</tbody>
</table>

Source: Survey 2013
After assessing the perception of partially and fully integrated farmers of the disadvantages of contract farming, the four items were combined into an indexed score and the results reported in Table 11. The results showed that fully integrated perceived more disadvantages compared to the partial integrators. However, the difference in perception between the two groups still was not significant. The mean for the partial integrators was 2.95 with a standard deviation of .502 and the mean for the fully integrated was 3.01 and the standard deviation was .712.

Table 11: Index Score of perceptions of the disadvantages of contract farming

<table>
<thead>
<tr>
<th></th>
<th>Mean (St. Dev.)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial integrated</td>
<td>2.95 (.502)</td>
<td></td>
</tr>
<tr>
<td>Full integrated</td>
<td>3.01 (.712)</td>
<td>.45</td>
</tr>
</tbody>
</table>

Source: Survey 2013

4.3.3. The influence of farmer organization on the perception of contract farming

The results of the analysis of perceptions of contract farming consistently showed that the partial integrators had a more favourable perception of the contract system than full integrators. The results are contrary to the expectation and lead to a rejection of the hypothesis. A cross tabulation between farmer organization and perception of the advantages was used to measure the influence of farmer organization on the perception of contract farming.

The results of Table 5 clearly indicate that partially integrated farmers were more likely to be registered with MOA than with other organizations. Furthermore, the results of Table 12 show that more than a half (51.3%) of members of MAO have
favourable perceptions compared with 31.6% of the members of other organizations. However, the influence of farmer organizations on the perception of contract farming is not significant.

**Table 12: Cross tabulation between perception of contract farming and farmer organization**

<table>
<thead>
<tr>
<th>Perception</th>
<th>MOA N =</th>
<th>TUCOPRCOS LTD</th>
<th>Both MAO and TUCOPRCOS LTD</th>
<th>KIOMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavourable</td>
<td>12 (30.8%)</td>
<td>17 (63.0%)</td>
<td>12 (54.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>7 (17.9%)</td>
<td>2 (7.4%)</td>
<td>2 (9.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Favourable</td>
<td>20 (51.3%)</td>
<td>8 (29.6%)</td>
<td>8 (36.4%)</td>
<td>2 (100.0%)</td>
</tr>
</tbody>
</table>

Pearson Chi-Square 10.48; p = .106

**4.3.4. The influence of off farm income on perception of contract farming**

To find out more about why partially integrated farmers perceive more advantages as compared to fully integrated, an analysis between off farm income and perception of contract farming was done. Table 13 shows the results of cross tabulation between off farm income and perception of contract farming. The results show that 53% of growers with higher off farm income (200,000Tsh and above) have favourable perception of contract farming as compared to 27% of growers with less income (income between 0 and 200,000Tsh). On the other hand, 47% of growers with less off farm income (0 to 199,000Tsh) have unfavourable off farm income as compared to 73%. The results are significant at p<.05 implying that higher off farm income is associated with favourable perception towards contracting and vice versa.
Table 13: Cross tabulation of off farm income and perception of contract farming

<table>
<thead>
<tr>
<th>Estimated off farm income</th>
<th>Unfavourable N = 41</th>
<th>Neutral N = 11</th>
<th>Favourable N = 38</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 99000</td>
<td>17 (41.5%)</td>
<td>1 (9.1%)</td>
<td>7 (18.4%)</td>
</tr>
<tr>
<td>100,000 to 199,000</td>
<td>13 (31.7%)</td>
<td>4 (36.4%)</td>
<td>11 (28.9%)</td>
</tr>
<tr>
<td>200,000 to 299,000</td>
<td>9 (22.0%)</td>
<td>2 (18.2%)</td>
<td>13 (34.2%)</td>
</tr>
<tr>
<td>300,000 and above</td>
<td>2 (4.9%)</td>
<td>4 (36.4%)</td>
<td>7 (18.4%)</td>
</tr>
</tbody>
</table>

Pearson Chi-Square 13.63; p = .034

4.4. AREAS OF DISAGREEMENTS IN THE SUGARCANE COMMODITY CHAIN

There are concerns related to contract farming. These concerns are manifested at different nodes along sugarcane commodity chain. Three questions sought to understand the perceptions of growers along the chain. They included perceptions about fairness in allocation of quotas, transparency in determining the weight of sugarcane and transparency in determining the content of sucrose. Also, one question was included in order to understand whether growers are paid on time. In the analysis perceptions were measured on individual items and then these items were combined into an index score.

Table 14 reports the results of the individual items. The results showed that both partially and fully integrated farmers had unfavorable perception about being paid on time. The mean perception for partial integrators was 2.13 with a standard deviation of .57 and the mean for the full integrators was 1.37 with the standard deviation of .49. The difference in means of the two groups of growers was significant at .01. Supporting the findings of this study was the edict from the District
Commissioner of Mvomero to close down the factory because of unpaid debt of Tsh 1.9 billion (USD 1.3 Million) that included farmers’ payments and salaries of employees.

Also, with regard to whether quotas are manipulated, the two groups had different perceptions. The partially integrated perceived that quotas are not manipulated whereby the fully integrated perceived that quotas are manipulated. Again, the difference was significant at \( p < .01 \) and the mean perception for partially integrated was 2.9 and 3.8 for fully integrated.

Furthermore, both groups of growers perceived that there was a lack of transparency in determining weight of sugarcane and the sucrose content. However, the difference in perceptions was significant only for sucrose determination and not significant for weight determination. As Table 14 indicates, both groups of farmers had means below 3; however, the mean for fully integrated farmers was smaller compared to that of partially integrated. This difference can be explained by the fact that the lack of transparency particularly in sucrose determination affects more the fully integrated farmers than partially integrated. During discussions with leaders of the farmer organizations the key informants indicated that fully integrated farmers were more affected by lack of transparency because in determining sucrose content it is not possible to attribute the amount of sucrose to a specific farmer. This is attributable to sugarcane gathered into piles at the cane yard containing sugarcane from different farms owned by different farmers. After the cane has been crushed, the sucrose content (rendement) is assigned randomly to farmers. This affects more farmers with smaller farms because a single round of crushing might contain
sugarcane from more than 10 farmers, thus attributing the rendement to a specific farmer is very difficult.

With regard to determining the weight of cane the source of concern was explained as the absence of grower representatives at the cane yard. Key informants indicated that the trucks carrying sugarcane off-load the cane at the cane yard after driving through the weighing bridge which determines the weight of the cane in the truck. An employee of MSEL then records the information from the computer. The key informants suggested that transparency in weight recording could be enhanced if they had their representative or an independent person who is not an employee of the MSEL, at the weighing bridge.

### Table 14: Perceptions of partial and full integrators on areas of disagreement

<table>
<thead>
<tr>
<th>Areas of disagreement</th>
<th>Mean (St. Dev.)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Partial integrated (N = 30)</td>
<td>Full integrated (N = 60)</td>
</tr>
<tr>
<td>After selling sugarcane to MSEL, you receive the payment on time</td>
<td>2.13 (.57)</td>
<td>1.37 (.49)</td>
</tr>
<tr>
<td>During harvesting season, quotas are manipulated</td>
<td>2.90 (1.49)</td>
<td>3.80 (1.31)</td>
</tr>
<tr>
<td>There is transparency in determination of sugar content (rendement)</td>
<td>2.07(1.14)</td>
<td>1.38 (.49)</td>
</tr>
<tr>
<td>There is transparency in determining the weight of sugarcane</td>
<td>1.67 (.60)</td>
<td>1.55 (.70)</td>
</tr>
</tbody>
</table>

Source: Survey, 2013

T-test** Significant at .01 level

After assessing the perceptions of partially and fully integrated farmers on individual items, the items were combined to form an index score and the result is reported in
Table 15. The results of the combined score showed that both partially and fully integrated had negative perception with regard to transparency along the sugar commodity chain and that there was no statistical significant difference in perception between the two groups of farmers.

<table>
<thead>
<tr>
<th></th>
<th>Mean (St. Dev.)</th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial integrated (N = 30)</td>
<td>2.20 (.44)</td>
<td></td>
</tr>
<tr>
<td>Full integrated (N = 60)</td>
<td>2.03 (.44)</td>
<td>1.70</td>
</tr>
</tbody>
</table>

Source: Survey 2013
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The first question this research sought to answer was to understand how growers are organized in the sugarcane commodity chain. The study found that there were two categories of farmers: fully and partially integrated farmers. Family labour and hired labour were the two main sources of farm labour. Farmers were organized under three farmer organizations including MOA, TUCOCPRCOS and KIOMA which act as intermediaries through which farmers were contracted. However, the two categories of farmers differ in terms of how they gain access to the market (MSEL). Fully integrated farmers gain market access either through farmer organizations or through partially integrated farmers. Partially integrated farmers only gain access to the market through organizations. The major services provided by these organizations include cane cutting, loading and transportation. Other operations like land preparation, planting and field maintenance are organized by individual growers.

The second question this research sought to answer was to understand factors that influenced growers to choose one contracting chain over the other. One major reason that influenced growers to register with a certain organization was because of its proximity or experience with an organization. Main benefits obtained were cane cutting, loading and transportation; second credit and third information.

In view of the above findings it is concluded that farmer organizations play an important role in contract farming and stronger farmer organizations may improve the
effectiveness and efficiency of the contract system at Mtibwa. However, stronger farmer organizations might threaten sustainability of the contract system if MSEL does not see them as important in achieving their goals. Therefore, it is recommended that efforts to strengthen farmer organizations should be supported by MSEL in order to avoid disputes between the two contracting parties.

The third question that this research sought to answer was to understand the perceptions of partially and fully integrated farmers of the advantages and disadvantages of contract farming.

In the first hypothesis it was expected that fully integrated farmers would perceive contract farming as having more advantages compared to partially integrated farmers due to receiving a full package of services offered under the system. In general partially integrated farmers had favourable perceptions of advantages but fully integrated farmers also had favourable perceptions of extension, new technologies, and reliable markets. Partially integrated farmers view contracting as more advantageous than fully integrated farmers runs counter to hypothesis.

For the second hypothesis it was expected that partially integrated farmers would perceive more disadvantages of the contract system than fully integrated farmers due to not receiving a full package of services offered under the contract system. The results showed that fully integrated farmers perceived more disadvantages compared to the partially integrated farmers. However, the difference in perceptions between the two categories of farmers was not significant.

The study found that the perceptions of advantages and disadvantages of contract farming were influenced by the possessions of resources including land, education and off farm incomes. Possession of these resources helped some fully
integrated farmers to move up the agricultural ladder to become partially integrated. It is recommended that MSEL should pay attention on the advantages that fully integrated farmers did not see as advantages, as they indicate specific problems that fully integrated farmers have with the contract farming system, and thus organizational services that need to be improved for this group of farmers. Also, to enable all categories of farmers to realize significant benefit from the contract system, efforts should be made to facilitate farmer cooperation outside of the MSEL to overcome resource limitations. Cooperation and pooling resources will reduce the level of dependence on integration hence greater freedom to maximize profit.

The fourth question which the study sought to address was to understand the main areas of concern along the sugarcane commodity chain. The findings showed identified four main areas of concern including manipulation of quotas, delayed payment, lack of transparency in determining the weight of cane and measuring sucrose content. Partially and fully integrated farmers had unfavourable perception about being paid on time. Also, both groups of growers perceived that there was a lack of transparency in determining weight of sugarcane and the sucrose content. Finally, partially integrated farmers perceived that quotas are not manipulated whereby the fully integrated perceived that quotas are manipulated. Even though the two groups of farmers differed in perceptions on individual items, in general both had unfavourable perceptions implying their dissatisfaction. It is concluded that the identified areas of disagreement offer strategic points where improvements can be made. Improvement along these areas is likely to promote trust which is a key
component of sustainability of contract farming. The following are some of the strategies that MSEL can use for improving trust:

- Improving transparency in determining the weight of cane and the sucrose content
- Allocation of quotas to farmer organizations should be fair based on the number of members and tons of cane to be harvested
- Timely payment
- Use of contract language that is easily understood
- A functional arbitration system should be in place, meaning that the government should explore alternative ways of enforcing contracts between the contracting parties.
- At the community level, MSEL should strengthen its corporate social responsibility section that will help to improve its public image through providing social services including health, schools, sports activities and community clubs/halls.

Besides improving trust between MSEL and out-growers, promoting competition in contract farming may improve the effectiveness of the contract system. Contract farming at Mtibwa is a designed monopsony (one buyer of the commodity), this situation gives MSEL much greater market power and leverage than do the out-growers. Allowing other sugar processing companies to operate in the area will limit this power and out-growers would get access to better services.

On the side of farmer organizations, farmer organizations should strive to provide good services to their members. In addition to provision of services of cane
cutting, loading and transportation, they can improve the capacities of their members by organizing training on modern sugarcane production, entrepreneurship, record keeping and interpretation of key clauses of the contract. Training can be made affordable by submitting a petition to public extension agents and district legal officers who can offer free training or train them at low cost. Relying on available public resources would improve the sustainability and reduce donor dependency syndrome.

In conclusion, contract farming at Mtibwa is not performing well. A significant number of out-grower schemes were not satisfied with the performance of the system and seemed to lose hope to find the solution of their problems. Their dissatisfaction might be one of the reasons for the poor productivity performance of the out-grower schemes. Despite this fact, contract farming at Mtibwa enabled both resource poor and resources endowed farmers to participate in the contract system. Therefore, sugarcane contract farming still has the potential to link resource poor smallholder farmers with markets and thus uplift them out of poverty. However, for contract farming to effective and achieve the goal, the identified concerns need to be addressed by the stakeholders involved.
5.1. CONTRIBUTION TO/OF THE THEORY

The commodity chain analysis and the theory of diffusion of innovation were used. In the sugarcane commodity chain this research identified three main players. They include MSEL, the buyer and supplier of cane, the cane growers, suppliers of cane and grower organizations, the contracting intermediary. The research identified that MSEL has more powerful position in the sugarcane commodity chain compared to cane growers. The sources of power for MSEL include being more informed on sugarcane commodity chain compared to cane growers and the only cane buyer at Mtibwa. Also, MSEL gained more control of the chain by opening up more cane estates which enabled it to supply more than 50% of its cane requirements. All these gave MSEL a dominant position in the negotiation of contract including the amount, quality and the price of cane. This situation calls for strong grower organizations that are able to negotiate fair contract with MSEL. Also, strong farmer organizations might lobby for fair business environment. For example presence of other small and medium sugarcane processing companies that can stimulate competition among buyers.

This research confirms and extends our understandings of the theory of diffusion of innovations. The findings confirmed that the combination of Rodgers and Brown perspectives provides a robust framework for understanding contract farming in Tanzania.
5.2. LIMITATION OF RESEARCH

This study was conducted in Mtibwa in Mvomero District. Mtibwa was purposively chosen based on the reported inefficiencies in productivity. Since the study area was not randomly selected, the findings cannot be generalized.

5.3. AREAS FOR FURTHER RESEARCH

This study has revealed some issues that need further investigations. First is the issue of contract farming and food security. A significant number of farmers related contract farming with food insecurity. It would be important to understand farmer definitions of food security and why they believe contract farming leads to more food insecurity. Exploring pathways through which contract farming believed to constrains food security will shed light more light on the issue for necessary measures to be taken.

Secondly is the level of integration which farmers are likely to benefit more: the study found that partially integrated farmers had more favourable perceptions of contract farming compared to fully integrated farmers, this calls for further research which could include additional factors beyond those considered in this study. This study found that resources including land, off farm income and education were associated with the level of benefit and integration. The identified factors can be used as control in order to assess the contribution of other unexplained factors.
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Appendix A: Interview Schedule

Dear respondents the aim of this interview schedule is for study purpose only. In this study, anonymity and confidentiality will be highly observed therefore the information you will provide in no way will harm you. Please feel free to answer the questions, which will be asked correctly.

**Basic data**
- Date form filled (dd/mm/yyyy) _____ _____ __________
- Name of enumerator ____________________
- Division________________________
- Ward___________________________
- Village________________________
- Hamlet_________________________

*Screening questions (Circle the letter answer)*

1) During the past 12 months have you grown sugarcane for selling at Mtibwa Sugar Company?
   1. Yes      2. No

2) If yes in qn 1 above, who performed the following activities?
   1) Can cutting________
   2) Cane loading _________
   3) Cane transportation _________

3) In which category does the farmer belong?
   1) Contract farmer
   2) Non-contract farmer
   3) Others, specify______________________________
A. Perceptions of advantages (circle the appropriate response)

Below is the list of sentences that are related to contract farming. I would like to know your opinion on each sentence in terms of your own experience

A1. Contract farming has enabled you to get reliable market of sugarcane
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A2. Contract farming has enabled you to adopt new technologies of sugarcane production
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A3. If you grow sugarcane under contract it is easy to get credit
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A4. With contract farming accessibility of advice from extension agent is easy
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A5. With contract farming, sugarcane production inputs are readily available
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A6. Contract farming has improved local infrastructure like rural roads
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A7. How would you rate accessibility of extension services under contract farming?
1) Very inaccessible  2) inaccessible  3) Average  4) accessible  5) very accessible

A8. Contract farming arrangement has lowered transport costs of our sugarcane
1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A9. Contract farming has improved timeliness in delivery of sugarcane to the mill
1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A10. Have you ever applied for loan to help you in sugarcane production activities?
1) Yes  2) No

A11. If yes in (A8) above, did you get it?  1) Yes  2) No

A12. If yes in (A8) above, what kind of collateral helped you to get the loan?
1) Income from sugarcane  2) house  3) the group acted as a guarantor
4) Others (specify)

A13. A7. How would you rate accessibility of credit under contract farming?
1) Very inaccessible  2) inaccessible  3) Average  4) accessible  5) very accessible
Advantages of contract farming to other farmers

Below is the list of sentences that are related to contract farming. I would like to know your opinion on the advantages of contract farming in terms of other farmers in your community.

A14. Contract farming has enabled majority of sugarcane farmers of your village to get a reliable market
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A15. After selling sugarcane to the factory, farmers in your village are paid on time
   1) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A16. Do extension agents visit other farmers in your village?  1) Yes  2) No

A17. How would you rate accessibility of extension services in your village?
   1) Very inaccessible  2) inaccessible  3) Average  4) accessible  5) very accessible

A18. Contract farming has enabled majority of farmers in your village to learn various technologies of sugarcane production.
   2) Strongly disagree  2) Disagree  3) Neutral  4) Agree  5) Strongly agree

A19. If you agree, which of the following technologies have been learned?
   1) Spacing  2) Fertilizer application  3) transplanting  4) harvesting practices.
   5) Others
   (Specify)__________________________________________
A20. Contract farming has helped majority of farmers in your village to get access to credit
1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B: Perceptions of disadvantages (circle the appropriate response)

Below is the list of sentences that are related to contract farming. I would like to know your opinion on each sentence in terms of your own experience

B1. Contract farming denies you freedom on farm management decisions like intercropping
1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B2. Sugarcane production has negatively impacted your food security
1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B3. You are indebted because of sugarcane production problems
1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B4. Despite of the contract, in some years not all your sugarcane are purchased
1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

Below is the list of sentences that are related to contract farming. I would like to know your opinion on each sentence with reference to other farmers in your village
B5. Contract farming denies farmers in your village freedom on farm management decisions like intercropping

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B6. Farmers in your village have become food insecure because they produce more sugarcane than food crops

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B7. During harvesting season, quotas are manipulated

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B8. There is transparency in determination of sugar content

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B9. There is transparency in determining the weight of sugarcane.

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

B10. After selling sugarcane to MSEL, you receive the payment on time

1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

C: Participation in contract farming

C1. In which of the following organizations are you registered as a member?

1) MOA 2) TUCOPRICOS 3) Both 1 and 2 4) None of them

C2. If you belong to any of the above organizations, what are the main reasons for joining?
### Organization and Reasons for Joining

<table>
<thead>
<tr>
<th>Organization</th>
<th>Reasons for joining</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOA</td>
<td></td>
</tr>
<tr>
<td>TUCOPRICOS</td>
<td></td>
</tr>
<tr>
<td>Both MOA and TUCOPRICOS</td>
<td></td>
</tr>
</tbody>
</table>

C3. What benefits do you get by being a member of the organization you mentioned to be part of?

1. __________________________________________________________
2. __________________________________________________________
3. __________________________________________________________
4. __________________________________________________________
5. __________________________________________________________

C4. If you do not belong to any of the above organizations, what are the main reasons for not joining?

1) __________________________________________________________
2) __________________________________________________________
3) __________________________________________________________
4) __________________________________________________________

### Land details

D: Land details
D1. How much land (in acres/hectares) do you grow sugarcane? ________
D2. Of the land you grow sugarcane, how much is yours ________
D3. Of the land that you grow sugarcane, how much is rented ________
D4. If some of the land is rented for sugarcane production, what is the rental cost per year? ________Tsh/acre or ________Tsh/hectares

E: Labour
E1. How much labour do you use, including hired labour to assist in the following farming activities (related to sugarcane production) and how much do you pay them?

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. of people X no. of days (hired labour) if used tractor = cost/acre X no. of acres</th>
<th>Cost per unit (specify units)</th>
<th>No. of people X no. of days (family labour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Weeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Weeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Weeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Weeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Harvesting and hauling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transporting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
G: Inputs used

G1. Did you use any of the following farm inputs with sugarcane, if so, what was their source and unit cost?

<table>
<thead>
<tr>
<th>Input</th>
<th>Yes/ No</th>
<th>Source (self or where purchased)</th>
<th>Quantity (specify units)</th>
<th>Unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inorganic fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop pesticides</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New seeds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other specify</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H: Output

H1 What was the output of sugarcane for last year?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total tones harvested</td>
<td></td>
</tr>
<tr>
<td>Total tons sold</td>
<td></td>
</tr>
<tr>
<td>Price per ton</td>
<td></td>
</tr>
</tbody>
</table>

H2 Was this a new plant crop or ratoon crop?

1) New plant crop  2) Ratoon crop

H3 If ratoon in H2 above, was it the first, second, third, fourth or fifth ratoon? (Circle the answer)

H4 What is the name of the variety did you grow?______________________________
I: Location of the field to the mill and haulage costs

I1. How far is your field from the collection center or from the mill?

<table>
<thead>
<tr>
<th>Field 1</th>
<th></th>
<th>Field 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance in KM</td>
<td>Costs in TSh</td>
<td>Distance in KM</td>
<td>Costs in TSh</td>
</tr>
<tr>
<td>1 – 10</td>
<td></td>
<td>1 – 10</td>
<td></td>
</tr>
<tr>
<td>11 – 20</td>
<td></td>
<td>11 – 20</td>
<td></td>
</tr>
<tr>
<td>21 – 30</td>
<td></td>
<td>21 – 30</td>
<td></td>
</tr>
<tr>
<td>31 – 40</td>
<td></td>
<td>31 – 40</td>
<td></td>
</tr>
</tbody>
</table>

J: off-farm income

Off farm income is the portion of household income obtained off the farm, including wage-paying activities or self-employment in commerce, manufacturing and other services.

J1. In the following list of ranges of off farm income, please state where your estimated off farm income falls

1) 0 to 99000  
2) 100,000 to 199,000  
3) 200,000 to 299,000  
4) 300,000 and above

K: Respondent’s personal data

K1. Respondent’s name________________

K2. Sex of respondent: 1. Male

2. Female

K3. Are you the head of household? 1. Yes 2. No
K4. If no, what is your relationship with the head of household?

1) Wife  2) Oldest son  3) Other (specify)

K5. Number of persons in household (including the respondent)? ______

K6. Age of respondent (in years) ______

K7. What is your highest level of education? (tick one):

1) None  5) Technical/College
2) Primary  6) University
3) Ordinary (F1-F4)  7) Other (Specify)
4) Advanced (F5-F6)
Appendix B: Checklist for Key Informant Interview

1. What is brief history of contract farming at Mtibwa?
2. How contract farming is organized at Mtibwa?
3. What are the criteria used for recruiting contract farmers?
4. How many villages are involved in growing sugarcane?
5. What are the reasons behind for some farmers not getting involved in contract farming?
6. What services offered by farmer organizations?
7. What services offered by Mtibwa Sugar Estate Limited?
8. What do you perceive to be the benefits of contract farming?
9. What do you think to be the costs of participating in contract farming?
10. What are the main areas of conflict?