

**INSTITUTIONAL AND ECONOMIC ANALYSIS OF SMALL FARMERS'
CONTRACT FARMING: A CASE STUDY OF MANYARA REGION TANZANIA**

BY

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ABSTRACT

The rise of contract farming and vertically integrated firms of production and marketing is undoubtedly one of the most important changes in Tanzania economy. The study examined new role of contract farming (CF) in Tanzania towards designing partnership model in the light of transformation and industrialization of agriculture. The specific objectives were (i) To describe contractual arrangement found in the study area (ii) To examine the role of contractual arrangement in reducing transaction cost (iii) To analyse the effect of contract farming in increasing production to farmers and (iv) To assess the impact of contract farming in industrialization of agriculture by comparing contract and non contract farmers. Purposive and simple random techniques were employed in selecting a representative sample of contract and non contract farmers where 105 contract farmers and 122 non contract farmers were interviewed. The contractual arrangement found in study area was mainly multipartite contract farming model. The study reveals that contract farming reduces transaction cost to farmers, by having low number of frequency of selling and high asset specificity ($P < 0.01$) among contract farmers as compared to non contract farmers. Moreover results show that contract farming had significant positive influence in increasing farm productivity ($P < 0.05$). In assessing the impact of contract farming in industrialization of agriculture, results show that there is significant difference in farm input use, farm output and farm income between contract and non contract farmers ($P < 0.01$). Based on the findings, the study puts forward six major recommendations (i) establishing contract enforcement (ii) establishing quality control and monitoring system that will guarantee product standard (iii) establishing production quota to farmers (iv) monitoring human resource used in contract farming ensuring all terms of contract are observed (v) establishing insurance arrangement to act upon production and marketing risk and (vi) making investment in various services to facilitate production easily.

DECLARATION

I, MALIWAZA MBWANA, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and has neither been submitted nor being currently submitted for a degree award in any other University.

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DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

CA	Contractual Arrangement
CF	Contract Farming
DCs'	Developed Countries
LDCs'	Less Developed Countries
FAO	Food and Agriculture Organisation
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy and Research Institute
NIE	New Institutional Economics
TC	Transaction Cost
TCE	Transaction Cost Economics
UN	United Nation
URT	United Republic of Tanzania
VC	Vertical Coordination
VI	Vertical Integration

CHAPTER ONE

INTRODUCTION

1.1 Background

The trend of market-oriented reforms following multilateral trade liberalization and especially structural adjustment programs in developing countries has led to the increased integration of world markets (Reardon and Barrett, 2000). This means that farmers in the developing world are now more than ever linked to consumers and corporations of the rich nations. Although most of the changes in agricultural and food markets are taking place in developed countries (DCs), they have far reaching implications for agricultural development efforts in developing countries (Kirsten and Sartorius, 2002).

Consequently developing countries are currently attempting to develop agriculture as this sector is changing from an industry dominated by family farms, to the one that is characterized by large industrial firms that are more tightly aligned across the production and distribution value chain (Boehlje, 2000). The industrialization of agriculture is due to increase in scale of organization and the modernization in production, processing, and distribution systems. When replicated to developing countries there has always been a danger that majority of farmers would be excluded from profitable niche markets (Kandiwa, 1999; Sofranko *et al.*, 2000). These farmers are likely to be locked into low return commodities that are prone to price volatile (Reardon and Barrett, 2000). Drabentstott (1995; Boehlje, 2000) argue that there are two powerful forces driving this process of industrialization: *a new consumer and a new producer*. The new consumer is a highly demanding sort and the new producer is equipped with new technology and management tools that enable him to engineer food from farm to the table. Much of agriculture has, therefore, to shift from a philosophy of “here’s what we produce” to a

situation where farmers take note of what the consumer wants. This sounds like an ideal situation, but traditional markets do not handle these circumstances well (Kirsten and Sartorius, 2002).

The changes in food and agricultural markets (so called industrialization of agriculture) have influenced the need for higher levels of managed coordination. This has resulted in the introduction of different forms of vertical integration (VI), and other forms of coordination and alliances, which are now increasingly dominating the agricultural market chain (Royer, 1995; Pasour, 1998). This is, through establishing links between small firms/growers and larger entrepreneurs that have already overcome the major barriers to market entry, or by acting as ancillary units of bigger export corporations. Little and Watts, (1994); Eicher and Saatz (1998); Dalgado (1999) argue that although the process of industrialization has created opportunities for small holders in developing countries to provide a wide range of commodities under contract but still there is danger that the process will exclude farmers from high value markets due to the issues of food safety and standards. These need specialized production, packing techniques and refrigerated transport that entail large capital investments as well as investment in research and marketing development, which small and medium enterprises cannot easily afford.

Within this context, it is important to identify innovative approaches to provide financial services to agricultural producers with effect to substantiate market needs and opportunities, with significant livelihood enhancing implications (Goodland and Gordon, 1999). One approach, which has the potential across Africa, and considered as the one of the most promising institutional frameworks for the delivery of price incentives technology and other agricultural inputs is loosely defined as “Contract Farming (CF)”

(Glover; 1984, Goodland and Gordon, 1999).

Vertical coordination (VC) of food supply chains has gained a great deal of attention. Of particular concern is the effect of all these developments on the future of small-scale agriculture in developing countries (Overboom, 2000). The increased need for VC and supply chain management create a potentially new role for CF as a way to link small farmers to high value markets in the world of market liberalization in developing countries. Due to the requirements of new agriculture, food-marketing firms prefer to engage in marketing and production contracts with farmers to ensure greater coordination of quantity and quality of supply (Weatherspoon , 2001).

If we accept the premise that CF remains an important vehicle to keep small farmers involved in markets, it is now important to employ the lessons experienced with contract farming and use it to improve the working of this institution. The key issue is therefore to set up the types of institutions that can help to ensure that the poor benefit from globalization and industrialization. Of particular importance is, what factors to consider in contracting arrangements (CA) in facilitating smallholder farmers' access to markets.

With evolution and increasing prevalence of VC in agriculture the theoretical framework for evaluating these developments has also evolved. Several aspects in the New Institutional Economics (NIE) such as contract theory, and transaction cost (TC) can be used to illustrate this paradigm.

1.2 Problem statement and justification

Contract Farming has long been practiced in DCs; its use in LDCs is significant and of

increasing importance (Glover and Kusterer, 1990), particularly in this age of market liberalization, globalisation and expanding agribusiness as larger farms become increasingly necessary for a profitable operation, and agriculture become less dependent on human labour (Reardon and Barrett; 2000, Eicher, 2003). For small farmers to survive in this array, they have to rely on external rather than internal economies of scale through vertical integration, contractual arrangements and other forms of coordination and alliances (Kherralah and Kristen, 2001).

Through CA, vertically integrated firms can assist farmers to move from traditional farming to commercial or modern farming. CF also is potentially a way to provide investors with the opportunity to guarantee a reliable source of supply, from the perspective of both quantity and quality (Little and Watts, 1994; Weatherspoon, 2001). On the other hand CF provides an opportunity for farmers to overcome credit constraint, minimising transaction costs and gaining market access, producing a product for a guaranteed market and eliminating some of farmers' risks (Kherralah and Kirsten, 2001). Added to that, is the concern in increasing public-private partnership in agricultural service delivery as public services delivery to the agricultural sector in developing countries declines (Glover and Kusterer, 1990; Eaton and Shepherd, 2001). Moreover, recent move on change in the retail outlets and growth of supermarket necessitate the need of having organized market; as supplies must be lined up on volume and quality to meet the timely demand of well trained consumer (Drabenstott 1995; White, 1999; Boehlje and Doering, 2000).

Basing on the fate of survival for small-scale producers, it is apparent that uses of VC characteristics of global agricultural industrialization deserve priority in Tanzania, as far

as development researches are concerned. This places a need for more appropriate institutional structure necessary to enhance small scale producers, using TC paradigm and ensure their participation in commercial supply chains and find if there is any incentives attained by contracting.

1.3 Objectives of the study

1.3.1 General objective

The principal objective of this study is to contribute towards the design of small farm agribusiness partnership model in order to promote industrialisation and transformation of agriculture in Tanzania, and find farmer's incentives that can be attained by contracting.

1.3.2 Specific objectives

- i. To describe contractual arrangement found in study in area.
- ii. To examine the role of contractual arrangement in increasing/reducing transaction cost in marketing farm product.
- iii. To analyse the effect of contract farming on yield levels to farmers.
- iv. To assess the impact of contract farming in industrialization of agriculture by comparing contract and non contract farmers.

1.4 Hypotheses

- i. Vertical linkage institutions have effect on minimizing transaction cost.
- ii. Contract farming has improved production to farmers.
- iii. There is significant difference in terms of farm input used, farm output and income between contract and non contract farmers.

1.5 Organisation of the study

This dissertation is organised into five chapters starting with the introduction chapter. Then the second chapter presents the relevant literature reviews. Study methodology is illustrated in chapter three, while chapter four presents the results of study and discussion. Concluding remarks and policy recommendations basing on the findings are presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter reviews the theoretical basis of the study, by giving the definition of the terms institution and contract farming, type of agricultural contracts, aspects that relate to transaction costs and smallholder farmers' access to markets; constraints on access to markets by smallholder farmers; the role of institutions and government to improve smallholders' market access; impact of infrastructure on market access; impact of quality and standards on market access; and impact of extension services, training and information on market access; issues of contract default and advantage and disadvantage of CF

2.2 Definitions of terms

2.2.1 Contract farming

Eaton and Shepherd, (2001), define CF as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices. The arrangement also invariably involves the purchaser in providing a degree of production support such as supply of inputs and the provision of technical advice. The basis of such arrangements is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the company (contractor) to support the farmer's production and to purchase the commodity.

Glover and Ghee (1992), argue that, the actual practice of CF is more complex than the simple definition given above, since there are many variations of different aspects of contracts; there is also no standard usage of the term (contract), that is different regions

(countries) use the term in different variation to represent specific situation. Hence more often contract farming and outgrower scheme are used interchangeably. To distinguish them *Contract farming*, generally connotes a private sector scheme while *Outgrower scheme*, generally connotes government scheme, with a public enterprise purchasing crops from farmers, either on its own or as part of a joint venture with a private firm. The term (outgrower scheme) is most used in Africa and Asia.

2.2.2 Institution

The most commonly agreed upon definition for an institution is a set of formal (law contracts, political system, organizations, markets, etc.) and informal rules of conduct (norms, traditions, customs, value system etc) that facilitate coordination or govern relationships between individuals or groups (North, 1990). Institutions have an influence on our behaviour and therefore on the outcome such as economic performance, efficiency, economic growth, and development (North, 1990).

2.3 Contract farming arrangements models

A wide range of organisational structures can be found in CF. The choice of the most appropriate one to use depends on the product, the resources of the company, the social and physical environments, the needs of the farmers and the local farming system (Eaton and Shepherd, 2001). Nevertheless contract farming may fall into any one of the five models presented in the appendix 2.

2.4 Crop selection under contract farming

One of the key issues in any new agricultural development such as contract farming is the selection of the main crop or crops to be grown (Glover and Ghee, 1992). The crop

selection reflects several considerations. The first is the coverage of the organizational forms. The second is the importance of the crops in terms of employment and revenue. For example in Malaysia and Indonesia rubber is a major commodity in those countries in terms of both revenue and employment (Glover and Ghee, 1992). Emphasizing more, CF is not proper if applied to traditional or staple crops. It works well with only certain farm products and only to crops with certain suitable production and marketing qualities; it cannot be used with general agricultural products, especially those that are staple crops (Glover and Ghee, 1992; Eaton and Shepherd, 2001). This is because staple crops lack competitiveness as price is concerned, hence low returns. Historically, crops such as sugarcane, cocoa, coffee, dairy products and poultry industries have been most favored under contract schemes due to their requirement and profit prospects (Eaton and Shepherd, 2001).

2.5 Key determinants for successful contract farming

Prime pre-condition for any investment in CF must be of profit making relative to its alternative business. Therefore, profitable market, physical and social environment, government support and developmental role are key determinants for CF (Eaton and Shepherd, 2001).

2.5.1 A profitable market

On the sponsor side: The sponsor's decision to invest in a particular market must be based initially on the knowledge that is subject to certain conditions that will be profitable (Eaton and Shepherd, 2001). It should be understood that, contract is just one of a number of solutions to a commercial market opportunity. To accomplish this, companies engaged in high-value horticultural exports need to be certain that they can meet existing quality

standards and likely future market requirements.

On the farmer side: To ensure that the scheme does not collapse, both farmer and sponsor should have attractive financial benefits (Eaton and Shepherd, 2001). Therefore, sponsors need to be sure that farmers will obtain higher net incomes by entering into a contract than they could from alternative activities with the same, or less risk. The yield should be calculated in order to forecast whether production by farmers could be profitable at prices the sponsors are able to pay. The estimates should be based on the experience of the farmer in the chosen area and probably by comparing with the yield of similar farmers outside the contract, with similar soil fertility and their historical production data (Eaton and Shepherd, 2001).

2.5.2 The physical and social environments

Physical environment (utilities and communications; land availability and tenure; input availability) have an effect on agribusiness venture (Eaton and Shepherd, 2001).

Utilities and communications; the existence of an adequate communication system that includes road, transport telephone and other telecommunication services are particularly important in the case of perishable crops that need to be processed soon after harvest or stored in a suitable environment.

Land availability and tenure

Contract farming can involve a wide spread of land ownership and tenure arrangements. Farmers under contract must have unrestricted access to land on which to plant their crops. There must be an awareness and understanding on the part of management of how farmers gain access to land for cultivation and for their access to be acceptable within the framework of the contract. However, within a single project there can be numerous

variation of land tenure, including freehold title, formal lease of state land, leases from the sponsor's own estate and informal seasonal arrangements with landlords (Glover and Ghee, 1992).

Input availability

Contract Farming ventures call for varying levels of inputs depending on the nature of the crop and the degree of the farmers' sophistication. In most cases the sponsors recommend, procuring and distribution of many or all of the material inputs. Sponsors need to be assured that they will be able to organize the supply of all necessary inputs for the farmers and for their own processing needs. All inputs should be identified and ordered well in advance. Failure to have ready access of these inputs can cause serious disruption to the production chain and can result in serious financial losses for all parties (Goodland *et al.*, 1999).

2.5.3 Social consideration

Conventional societies are normally more conservative in their ambitions and material needs (Eaton and Shepherd, 2001). There are often great disparities in cultural attitudes towards work. There is always the possibility that the economic success of a CF venture could, in fact have social repercussions that jeopardize its long term success. This may occur, for example, because the opportunity to participate is limited to a certain number of farmers. Therefore, before beginning a venture, there is a need to develop an understanding of the cultural attitudes of those with whom they are working. They must also be particularly aware of the possibility of disputes when there is more than one cultural group working on the contract (Eaton and Shepherd, 2001).

2.5.4 Government support

In order for the CF system to work properly government should provide enabling and regulatory environment (Eaton and Shepherd, 2001). CF operates well when there are suitable contract laws and other laws as well as existence of an efficient legal system (Eaton and Shepherd, 2001). Governments need to be aware of the possible unintended consequences of regulations and should avoid the tendency to over regulate.

2.5.5 The developmental role

As contract farming grows in importance governments should perhaps reallocate development resources towards its promotion. This involved organizing forums where agribusiness entrepreneurs could meet farmers' representatives to discuss their requirements. For example in Philippines, by 2000 at least 27 companies had established contractual relationships with farmers as a result of this programme (Eaton and Shepherd, 2001). To facilitate this action contracted farmers are organized into cooperatives or groups where by the governments can play an important role by carrying activities to strengthen the managerial skills of these organizations.

2.6 Contract and their specification

FAO (2001) stated that contract agreement usually covers the responsibilities and obligations of each party, the manner in which the agreement can be enforced and the remedies to be taken if the contract breaks down. Aspects that need to be considered when drafting contracts include:

- The legal framework – The formal law of contract as well as the manner in which that law is used and applied in common practice
- The formula – Clarification of the managerial responsibilities, the pricing

structures and the set of technical specifications that directly regulate production

- The format – The manner in which the contract is presented (formal agreement, simple registration and verbal agreement)
- The specification – The details of the implementation of the contract. Contract should specify: contract duration, quality standards, production quotas, cultivation practices, pricing arrangements, payments procedures, technical support, input to be provided and insurance arrangements.

2.7 Theoretical basis

This study builds a case on the basis of transaction cost economies to explain the role of institutional arrangement in improving market access. The use of transaction cost to match transaction characteristics and organization structure can be employed in the design or assessment of contract farmer's governance structures (Williamson, 1996; 2000).

2.7.1 Transaction cost economics

The concept of transaction cost economics (TCE) has its origin in the “New Institutional Economics (NIE) Theory” which in turn, draws upon insights from institutional economics, information theory and organizational theory (North, 1994). The general hypothesis of TC of the NIE is that institutions are transaction cost- minimizing arrangements, which may change and evolve with changes in the nature and sources of transaction costs (Coase, 1988; Bhardan, 1989). Coase (1988) and North, (1990) argue that market exchange is not costless, considering that any transfer of property right in reality involves a certain amount of transaction cost. Transaction costs occur when performing the following activities: The search for information about potential contracting

parties and prices and quality of the resources in which they have property rights, the bargaining that is needed to find the true position of contracting parties, the making of contracts, the monitoring of contractual partners to see whether they abide to the terms of contract, the enforcement of contracts and the collection of damages when partners fail to observe their contractual obligations (North, 2000).

In the context of agricultural marketing two other costs are important, these include: screening costs, which refers to the uncertainty about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods; and transfer costs that refer to the legal or physical constraints to the movement and transfer of goods (North, 1994). Transaction costs thus include costs resulting from distance to markets, poor infrastructure, high marketing margins, imperfect information, supervision and incentive costs.

Therefore TC has important role in the organization of firms and other contracts. TC can influence the decision to participate in the markets as well as the level of participation. (Barney and Ouchi, 1988; Foss, 1995).

These TCs emanate from a number of sources. Highlighting these, in the first place, small-scale farmers are located in remote areas far away from service providers and major consumers of farm products. The distance to the market, together with the poor infrastructure, poor access to assets and information is manifested in high exchange costs. In order to participate in the market farmers must determine whom to deal with, what are terms in draw up a contract and take the inspection needed to make sure that the terms of the contract are being observed (North, 1990). These operations are often costly enough to

prevent transactions from taking place. Transaction costs also result from institutional problems such as lack of formal markets (Sadoulet and de Janvry, 1995).

Sadoulet and de Janvry (1995) noted that TCE is especially relevant for agricultural market analysis in developing countries and the changes in the agricultural sector in general. This is because many of the institutions, or formal rules of market behaviour that facilitate market exchange in developed countries are absent in low-income countries. The frequent occurrence of market failure and incomplete markets in developing countries require an institutional analysis. It is hypothesized that high transaction costs as a result of poor institutional arrangements are the causes of low market participation of small-scale farmers in developing countries. Thus transaction cost becomes the unit of analysis; this implies that transaction costs economics can potentially offer useful insights to agricultural policy research in developing countries.

In the context of the greater need for coordination, the role of transaction costs, trust, and relationships, formal and informal contracts, vertical linkages, information asymmetries, and strategic alliances become very important (Kherralah and Kristen, 2001). Especially important will be to analyse the institutional response at the farm level to globalisation. How can we include small farmers in export markets? Here we need to understand the role of contracts and how they emerge. The transaction costs framework can contribute in explaining the choice of contracts among farmers and traders, and local traders and multinationals (Kherralah and Kristen, 2001).

Contrary to Neo- Classical economics, which assumes economic agents operate almost in a vacuum, NIE acknowledges the important role of institutions in influencing market

exchange. New institutional economics both explains the operation of institutions and their evolution and it evaluates their determinant impact on economic performance, efficiency and distribution. There is a two-way causality between institutions and economic growth. On one hand, institutions have a profound influence on economic growth, and on the other hand, economic growth and development often result in a change in institutions. It must be said that not all institutional changes are beneficial but in fact, by influencing transaction costs and coordination possibilities, institutions can either facilitate or retard economic growth (North, 2000).

2.7.2 Determinants of transaction cost

A major postulate of the paradigm of the TCE is that market firms and other forms of association (e.g. various form of contractual relations) compete as alternatives for coordinating transactions (Williams, 1993). However the exact institutional form that will be preferred in a specific transaction situation is a decision variable that is dependent upon the type and magnitude of transaction frictions that are to be overcome. As such institutional and organizational structures not only vary in form and content but they also tend to substitute each other depending on the actual circumstances. Williams (1985) has identified three main features of transactions that interact the environment surrounding transaction to create transaction cost. These are frequency, asset specificity and uncertainty.

2.7.2.1 Frequency (Repetitiveness)

The rate at which transaction has to be repeated determines the level of costs. Therefore, TCs have to be minimized by designing or choosing an appropriate institutional arrangement that will facilitate market (Joseph, 1984). This is because the more often the transaction takes place is the more widespread of the fixed cost.

2.7.2.2 Specificity

This refers to the extent which investment in significant (non-trivial) assets and which have limited alternative uses are committed by parties to a transaction process. When such investment or resources are specified into a transaction (in the form of technology, human capital or other long term investment such as good will) a situation of bilateral monopoly is created (Williams, 1985). Transaction process that are supported by such investments transaction specific assets experience “lock –in” effects on which account autonomous trading will be supplanted by unified ownership (Williams, 1985).

2.7.2.3 Uncertainty

This refers to the existence of unknown variables or disturbances in the transaction atmosphere, which make the transacting atmosphere more complex. This also involves the range of agronomic, biological and climatic variables together with the price of produce in alternative markets.

2.8 A new institutional perspective on contract farming

New Institutional Economics (NIE) can be used to explain the theoretical rationale for CF as an institutional arrangement, and provides an additional motivation for the VI (Kirsten and Sartorius, 2002). NIE viewed contract farming as one of the governance forms in a VC continuum that can be utilised to effect the requirements of higher levels of managed coordination. CF is an intermediate form of industrial organisation in agriculture, standing between spot markets and full vertical integration. At the one end of continuum, we have spot market transactions, with coordination of the activities in the supply chain coordinated by the price mechanism (Kirsten and Sartorius, 2002). However theoretically this form of industrial organisation is usually applicable under conditions of the perfect

market (Williamson, 1993; Barney and Ouchi, 1988). The NIE become useful as many of the problems of market failure and missing markets are typically caused by asymmetric information and a range of other factors that impact on transaction costs (Minot, 1986; Key and Runsten, 1999).

2.9 Constraints on access to markets by smallholder farmers

Marketing and processing problems constitute the major constraints to capturing the available opportunities for small-scale farmers (Broken, 1990). These marketing problems have to be addressed if agricultural sector has to realize its full potential in stimulating broad base agricultural and economic development (IFAD, 2001), without market access, the potential benefits of higher producer prices and lower input prices are not transmitted to the poor farmers.

According to IFAD (2001) the problem of market access by smallholders may be considered in three dimensions: the physical (the distance to the markets); the political (their ability to influence terms upon which they participate in markets); and the structural (the lack of market intermediaries). All of these must be tackled to ensure desired effects on production, output or incomes.

The physical dimension: Infrastructure in many of the developing countries, especially in rural areas where most of agricultural activities take place, tends to be dilapidated or non-existent. The lack of passable roads in many rural areas means that it is difficult for the poor who live there to get their produce to markets or that the costs of doing so are much higher than they would be if transport were easier (IFAD, 2001; Omamo, 2001). Moreover, flow of market information depends on the condition of the physical

infrastructure. Poor rural infrastructure implies that either traders cannot travel to, or communicate with rural areas to purchase the output of the poor. This limits the number of traders who go to the rural areas to collect produce and hence eliminate competition and bargaining power of the small farmers (IFAD, 2001).

Political dimension: In many countries, small poor producers in the agricultural, manufacturing and service sectors are constrained by heavy and often incomprehensible bureaucratic regulations and other barriers that can limit their ability to enter into the market economy or to take advantage of new opportunities (World Bank, 1996). Many statutory procedures, such as registering, licensing and start up taxes, can place a disproportionate cost on micro firms and hence limit their access to markets. The roles of institutions and policies also have a profound influence on market access and development of the rural economies (UN, 2002; Minot and Ngigi, 2004; URT, 2005). Institutions that lower TC are important to ensure market access of smallholders. But in most of the developing countries such institutions (for credit, risk management, input supply and output marketing) are not well developed and hence they limit smallholders to take advantage of new opportunities and participation to markets (IFAD, 2001).

2.10 The role of institutions and government to improve access to market

Most of smallholders in sub-Saharan Africa practice either subsistence farming or operate largely in local markets due to lack of connection to more lucrative markets (IFAD, 2001). As a result, incentives remain weak, investments remain low resulting into locked to equilibrium poverty trap. For small farmers to get out of this poverty trap which is brought about by lack of market access, the role of accompanying institutions that can reduce market risks and transaction costs in the process of exchange, building social capital,

enabling collective action, and redressing missing markets is of particular importance for smallholder agriculture (Torero and Gulati, 2002).

Financial institutions also have an important role to play in enhancing smallholder marketing, due to the fact that small farmers lack assets (Goodland *et al.*, 1999). The adoption of capital-intensive technologies, which would result in increased production, such as processing, requires high capital investment. But small farmers do not have assets to meet this investment. Moreover their access to loans from the private financial institutions is limited by the lack of collateral and the nature of agricultural production. These financial institutions find it costly to deal with this type of clientele (Koenig and Doye, 2002). Furthermore, the financial system in developing countries is much less developed, having a much narrower range of institutions and instruments and being smaller relative to the size of the economy. Therefore government policy should be directed towards encouraging the growth of financial system to support small farmers, as this will ensure linking farmers to markets (URT, 2005).

Grades and standards are another set of institutions that play a crucial role in providing internationally recognized information and quality assurance about a product, thereby facilitate trade and reducing transaction costs. However grades and standards can also be used as non-tariff barriers to trade. Thus imposition of minimum standards that can be met by small farmers is important for small farmers' access to markets (Reardon *et al.*, 2001).

Risk management and market information require an institutional support. Due to high cost of acquiring information and its public nature, private agents may find it unprofitable to engage in search for information. In a liberalised market economy instruments to cope

with marketing risk are essential to increase the commercialisation of agriculture and encourage farmers and traders to participate in agricultural markets. These include informal institutions such as CF and other mechanisms to tie input and output markets.

Though institutions can play a better role in linking farmers to markets, there is emerging consensus that governments have also a significant role in closing the access gap through playing an important facilitating role in helping institutions and forms of collective action to emerge that will effectively reduce transaction costs of market entry and participation by smallholders (IFPRI, 2003). The role of government policy is becoming increasingly important due to the realization that market access and technology are areas that are subject to both economies of scale and rent-seeking behaviour (IFPRI, 2003). Thus, there are areas, which cannot be served by the private enterprises as may appear uneconomic. In these areas the market access gap will continue to exist even under efficient market conditions, and therefore is where governments need to intervene (Torero and Gulati, 2002). Governments should provide services such as public utilities, research and sometimes extension services (Minot and Ngigi, 2004).

2.11 Impact of infrastructure on market access

Market infrastructures can be classified as hard (such as roads) and soft (such as access to credit, extension services, marketing information, security, risk bearing and agricultural inputs). A well functioning infrastructure is critically important to efficient agricultural marketing. The presence of good infrastructure is expected to increase the efficiency of both marketing and production as they reduce transaction costs and ensure more competitive pricing conditions in marketing than would occur in their absence (Minten and Kyle, 1995). Thus, regardless of their nature both types, hard and soft, have a significant impact on market access by farmers.

2.12 Impact of quality and standards on access to markets

In most countries safety and quality of food is becoming a matter of increasing concern. Information is readily available to consumers through the mass media and they are considerably more aware of existing and potential risks from pesticide residues, food poisoning and a poor diet (Fellows and Axtell, 1995). Thus the competitiveness of food production will soon be more dependent on safety and the quality of the food and acceptability of the production procedures than on quantity and price. In contrast to the quantity-oriented markets that are often subsidized and producers can always sell everything they produce, quality-oriented markets are market-driven (FAO, 2004).

In order for small farmers to improve and control product quality it is essential for them to fully understand the meaning of the term quality. A common definition is “achieving agreed customer expectations and specifications”. In other words the customer defines the quality criteria needed in a product. Thus farmers and processors have to put in a quality control system to ensure that the product meets these criteria on a routine basis (Fellows and Axtell, 1995).

2.13 Economics of information

Transaction cost economics school and the literature on economics of information to a large extent are intertwined. Searching for market information is not costless (Coase, 1937; Stigler, 1961). That may explain why we may have divergence of prices between efficient markets and why capital markets are “imperfect”.

The importance of market information cannot be understated particularly at this era of market liberalization. Producers need market information to predict trends in the economy

and make useful decisions on production. Provision of market information to smallholder producers in Tanzania is however still a problem. Coulter (1994) reports that financial constraints and lack of commitments are the major constraints to the development of an information system that could provide information to the smallholder producers.

The information asymmetry can be used to explain the emergency of key agrarian institutions. These includes institutions such as sharecropping, interlocked contracts, credit and land lease which serve as substitutes for missing insurance market in an environment of pervasive risk, imperfect information and high transaction cost (Bhardan, 1989).

2.14 Advantage and disadvantage of contract farming

Contract farming has advantages and disadvantages for both farmers and investors (Roy, 1963; Kherallah and Kirsten, 2001). It is from these advantages that make up the reasons for contracting. Existing economic literature on agricultural contracts shows that there are two main reasons for entering into contracts: the first one is a way to share risks and the second one as a means to reduce transaction costs (Little and Watts, 1994). Benefits to farmers are discussed below:

- Contracting farmers overcome barriers of entry into crop and animal specific sector as they gain access to information, technology, marketing channels, managerial skills, technical expertise, access to plant and equipment and patented production procedures (Little, 1994; Pasour, 1998).
- Farmers can reduce production costs and increase production and income as result of their use of new technology and their access to company inputs (Little, 1994).
- Contracting farmers can reduce marketing risk and stabilise income and, in this

sense the integrator provides a form of insurance (Little and Watts, 1994; Sofranko *et al.*, 2000). Farmers' price risk is also reduced as many contracts specify prices in advance (Eaton and Shepherd, 2001)

- Contracting farmers can increase profit opportunities through a greater product range and differentiated products (Pasour, 1998).
- Facilitate shift from subsistence to commercial farming (Sofranko *et al.*, 2000). This is particularly important for farmers in developing countries.

2.14.1 The disadvantages of contract farming to farmers

- production risk may increase due to failure to fulfil the need of the contractual obligations of the integrator (Royer, 1995).
- Farmers' loss of autonomy, as farmers operates under a centralised control system (Pasour, 1998; Sofranko *et al.*, 2000). Here a contracted farmer sometimes reduced to little more than a hired hand.
- Farmers are disadvantaged by the high level of manipulation of the contract, in terms of both the legal and tacit arrangements (Glover, 1984; Porter and Howard, 1997).
- More general, contracting universally increase land use intensity and can lead to higher levels of pollution (Runsten and Key, 1996).

2.14.2 The advantages to agribusiness firms

Agribusiness firms can benefit by cost reduction, as a result of a more synchronised input-output processing function (Azzam, 1996).

2.14.3 The disadvantages to agribusiness firms

A principle disadvantage frequently associated with contract farming in developing countries is the high level of TC. Transaction costs are often excessive in projects involving large numbers of small farmers who are spatially dispersed, require high levels of inputs and support and who make smaller, more frequent deliveries to the agribusiness (Key and Runsten, 1999). Moreover, small farmers borrow more, often require the use of specialised equipment, require more intensive monitoring and make more frequent deliveries of smaller quantities to the integrator, resulting in increased cost per unit of raw commodity supplied. This presents a great danger for small scale farmers in developing countries, and may lead to the marginalisation of small scale farmers from contract opportunities (Kirsten and Sartorius, 2002)

2.15 Contract default

Apart from a vital role which contract farming plays in provision of agricultural services to small holder but there are two main problem areas which result in high costs and often undermine viability, these are contract default and the scale of farmers operations (Poulton, *et al.*, 1998; Glove and Kusterer, 1990).

Contract default may occur in two ways. A company may break a contract with farmers for example by failing to deliver inputs and services at the right time or arbitrarily raising quality standards. In these entire situation a farmers is generally in a weak position. On the others side farmers sometimes break contracts either on account of production failure or because they have sold the produce to competing buyers and fail to repay credits (Poulton, *et al.*, 1998). The absence of effective legal systems, the lack of collateral held by smallholders and weak insurance sectors create a considerable risk for companies entering

into contracts. The problem of deliberate default has been exacerbated by failed development programmes, where credits have not been recovered, fostering a perception among some farmers that penalties are minimal. The probability of default is greater with staple commodities and other crops for which there are many buyers.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Overview

This chapter presents the methodology used in this study. It covers the conceptual framework governing the study; description of the study area; study design; type and source of data collected; sampling procedure and sample size and tools of data analysis.

3.2 Contract farming conceptual framework

This study applied a modified conceptual framework from that developed by Glover and Ghee, (1992). The conceptual framework illustrates that contract farming acts as an institutional framework for delivering of incentives, technology and agricultural inputs. The framework is presented in Figure 1.

The figure illustrate that the contractual arrangement involves contractual relationship between farmers and central processing or exporting unit. The unit can be a firm, public/private agency or a joint venture of several types. In contract farming a firm purchase produce from local farmers, purchases that can supplement or substitute for company production. The terms of the purchase are arranged in advance through contracts, the exact nature varies considerably from case to case. Contracts are generally signed at planting time and specify the quantity that company would buy, price it will pay for it and quality; the firm also retain the right to reject substandard produce (Glover and Ghee, 1992). Some contracts use facilitating agency that provide the required services (input, credit) to farmers through contracting company (Glover and Kusterer, 1990).

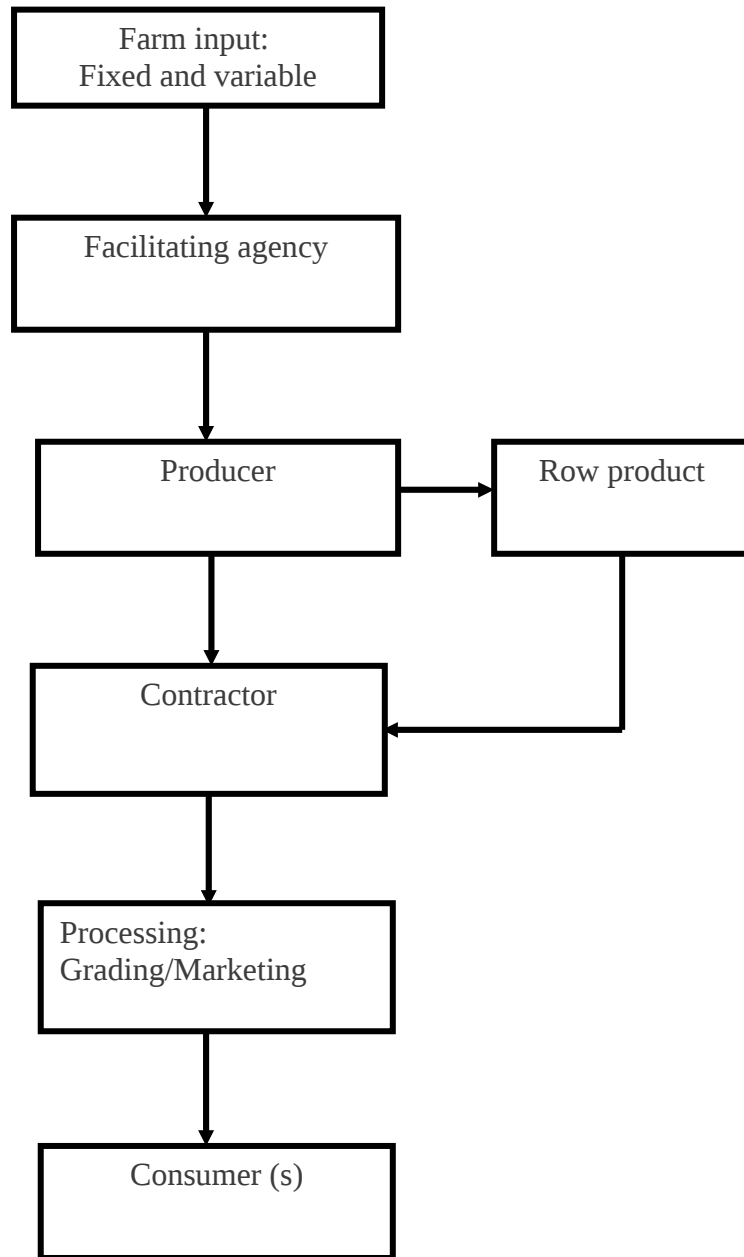


Figure 1: Conceptual framework of contract farming

Source: Modified from Glover and Ghee, (1992)

3.3 Study design

The study uses cross sectional data, where data for the period of October 2004 – October 2005 were collected. This study employs a case study method to test the hypotheses. The transaction cost theory, was used as a basis to select, process and analyse certain data. A case study approach was employed because of the qualitative nature of the data; in addition to the ability to explore a wider range of variables that influence the structure and performance of smallholder supply chains (Kirsten and Sartorius, 2002).

3.4 The study area

The study was conducted in Manyara, Babati district in Arri, Mandi and Galapo wards. Babati district and in particular Arri and Mandi wards were purposefully selected because of the available large number of small farmers that produce under contract; in contrast with other areas such as Arusha region where there are contract farmers but are mainly large-scale farmers. To obtain non contract farmers for comparison purpose that produced the same crops found in contractual arrangement, Galapo ward was selected due to having a considerable number of farmers producing the same crop under no contract.

3.5 Data collection and sources

3.5.1 Primary data

The primary data from the sampled farmers were collected through formal survey by means of structured questionnaire. Before the actual survey, pre-testing of a questionnaire was conducted to check the relevance of questions and to determine whether it was comprehensive enough to collect the required information. The information collected included household general characteristics, crop production, and household source of income including off- farm activities. Other information was on labour and use of farm input.

3.5.2 Secondary data

Secondary data were collected from Babati district council and wards within Babati district where survey was conducted. Data from the Babati district council were mainly for the social economic profile for the district and the Manyara region at large. While, information from the wards was on the number of the contract farmers, their performance and the mode of the contract in the study area.

3.6 Study population and sampling procedure

The study population included all sunflowers' farmers producing under contract found in study area and a group of non contract farmers producing sunflower. The study used purposefully and random sampling to obtain a representative sample of the study. Purposefully sampling was used to obtain contract farmers while non contract farmers were obtained by random sampling technique. Purposefully sampling was used because of sparse and limited number of farmers in study area who produce under contract. Random sampling was used to reduce biasness due large number of non contract farmers available in study area.

3.7 Sample size

The study aimed to interview 300 farmers; 150 in each group i.e. contract and non contract farmers. However a total of 227 were obtained and interviewed for this study (due to unavailable of contract farmers). Thus the sample constituted of 105 contract farmers and 122 non contract farmers. Although sample size was limited to 227 it was sufficient enough to allow for statistical analysis.

3.8 Tool for data analysis

Data were analyzed using Statistical Package for Social Science (SPSS) computer program. Both descriptive and quantitative analyses were carried out.

3.8.1 Descriptive statistics

Statistics such as means, frequency distribution, percentage, average, and cross tabulation were used. Cross tabulation analysis was used to segregate respondents characteristics based on certain criteria such as price paid to each group and marketing problem faced by each group; in order to determine whether or not the variable were statistically independent.

3.8.2 Institutional analysis

Institutional analysis was conducted to assess the performance of contract farming in promoting production and marketing to small- scale farmers and investigate problems encountered. Assessed aspects were type of contract farming practiced, number of farmers enrolled, performance of input delivery system, effectiveness of extension services, ways price set to farmers in enhancing production and marketing activities. Other aspects were role of facilitating agent, contractor and the farmers in the sustainability of contract farming.

3.8.3 Quantitative analysis

3.8.3.1 Non parametric tests

Non- parametric tools used in this study are Chi-square and t-test.

t- tests were used to test the significance in difference in mean prices, size of the farms between contract farmers and non-contract farmers, while Chi-square tests were used to

test the significance of distribution of data based on certain criteria services obtained in production and marketing of product.

3.8.3.2 Regression analysis

Regression analysis was used to test the significant of contract farming in reducing transaction cost; also on estimating yield levels Cobb-Douglas production function was used to estimate such an impact.

3.8.3.2.1 Effect of contract farming on reducing transaction cost

To assess the effect of contract farming in reducing transaction cost, linear probability model was proposed Masten (1982), cited by Shechambo, (1993). The linear probability specification of a binary regression model assumes that, for binary outcome Y and regressor vector X :

$$\Pr(Y = 1|X = x) = x'\beta.$$

There has been a wide range of application of liner probability model in the literature. For detailed information see Madalla (1992); and Gujarati, (1988). Given our research objectives, vertical integration is set as a function of transaction cost as follows:

$V = f(K, F, I, \mu)$; where:

V = a quantitative measure of vertical integration (ranging from low level market transaction to high internalised transaction). An indication of V may be set as probability distribution that given mode of transacting will be preferred by transactors relative to another. The aim is to determine under which condition a buyer or a seller will choose one among three governance structures (spot market,

extended contracts or internalised transaction). In other words under which conditions is it profitable to integrate (forwards, backwards or laterally) and to what extent? In this study V will represent whether farmer is in contract or not, bearing in mind that this has direct effect to the market where farmers transact.

K = the measure of factor specificity involved in transaction; here commitment of the transacting parties is considered in terms of resources whether in the form of technology, human capital or other long-term investments.

F = frequency potential number of administrative transaction.

I = the index of uncertainty associated with transaction, measured in terms of expected outcome i.e. whether the transaction will take place or not and if the term of agreement will be honoured (trustfulness).

μ = random factor.

The following propositions from Williamson (1993) can be tested for consistency in terms of the sign of estimated coefficients and statistical significance.

Assets specificity (K): The higher the level of assets specificity the higher the probability that a more vertically integrated mode of governance will be preferred for the transaction.

Frequency (F): The more the expected frequency of transaction, the greater the transaction cost. Therefore for governance organizational structure a negative sign is expected.

Uncertainty (I): The higher the level of uncertainty expected the more the likely will be the choice for integrated governance structure.

A drawback of this model is that, unless restrictions are placed on β , the estimated coefficients can imply probabilities outside the unit interval i.e admissible range (0,1). For this reason, the Logit or the probit models are more commonly used (Madalla, 1992).

However, one situation where the linear probability model is commonly used, is when the data set is so large that maximum likelihood estimation of a logit or probit model is computationally difficult (Gujarati, 1988). Moreover, Linear probability model is easier to estimate than Logit or probit model. Therefore, this study opt to use linear probability model due to data set which is considerably large. Thus, for the linear probability model, $E[Y / X] = Pr(Y=1/X) = x' \beta$, so the parameter β can be estimated using least squares.

Apart from the above drawback, another problem with linear probability model mostly is the variance of the error term will not be constant, in technical term this is the problem of heteroskedasticity. This problem can be dealt with using the technique of generalized least squares (GLS) (Gujarati, 1988). Generalized least squares allows for a weighting matrix to be included into the estimation of β 's, and thus recover the problem of heteroskedasticity and autocorrelation as well. Therefore to take care of heteroskedasticity problem the equation was estimated by Generalized Least Square.

3.8.3.2.2 Effect of contract farming on yield levels to farmers

In assessing the effect of contract farming on sunflower production, Cobb –Douglas production function was used. This kind of production function was chosen based on the fact that, according to economic theory many production observations fit well in it. For detailed literature survey of the mode see Henderson's and Quants (1988). Given our research objective, the general functional relationship among sunflower production and the explanatory variables are estimated as:

$$Q = f(\text{AR}^{\alpha_1} \text{EX}^{\alpha_2} \text{SP}^{\alpha_3} \text{PS}^{\alpha_4} \text{CONTR}^{\alpha_5} \text{AP}^{\alpha_6} \text{TECH}^{\alpha_7} e^{\mu}) \dots \dots \dots (1)$$

The following is the general form of the Cobb-Douglas production function that was adopted in this study. The model used in this study was specified stochastically as

$$Q = \alpha^0 \text{AR}^{\alpha_1} \text{EX}^{\alpha_2} \text{PS}^{\alpha_3} \text{SP}^{\alpha_4} \text{CONTR}^{\alpha_5} \text{AP}^{\alpha_6} \text{TECH}^{\alpha_7} e^{\mu} \dots \dots \dots (2)$$

Where:

Q = Sunflower output and is a function of conventional inputs (kg)

AR = Area under sunflower (Ha)

EX = Experience in cultivating sunflower (years)

PS = Place of sell dummy “1” if sell on farm, “0” if not

SP = Sunflower price lagged one year (Tshs), as this varies across farmers.

CONTR = Contract farming which is crucial in delivery of agricultural supporting services and market linkage, dummy “1” if in contract farming, “0” if not.

AP = Knowing in advance price of main input,

TECH = farmer technical knowledge particularly on agronomic practices and education is used as a proxy for such knowledge. α_0 = Intercepts,

α_1 - α_7 = Parameters to be estimated and

e^{μ} = Error term

The hypothesized sign of the coefficients in the equation above are

Farm size (AR): (Area under sunflower). It was hypothesized that all things being equal, farmer with larger farm size would have much sunflower output. Therefore a positive sign was expected for the parameter attached to this variable.

Experience in producing sunflower (EX): Experience in sunflower production was expected to have positive effect, because experienced farmers expected to have gained skill and able to overcome any barrier in crop production, therefore have large amount of sunflower.

Place of sale (SP): It was expected that farmers who rely on selling on farm would produce less than those who have alternative market due to many expected buyers in formal market than buyers available at the farm, therefore positive sign was expected for farmers who sell in other alternative market than those who sell on the farm.

Sunflower price lagged one year (SP): It was expected that increase in sunflower price lagged will results to increases in output, as farmers will be motivated by price incentive to manage their field well resulting in an increased output in next season. The component always varies across farmers. Positive sign was expected for this coefficient.

Contract farming (CONTR): It was expected that contract farmers are likely to exploit the benefit of contract farming than those with no contract. Positive relationship with output is expected for this coefficient.

Knowing in advance the price of main input (AP): Positive or negative sign was expected to this coefficient because knowing in advance that price of input will be higher, farmer

may either lower farm size or other input (labour) therefore produce less, likewise if price will be lower farmer may increase farm size and therefore have much output.

Farmer technical knowledge (TECH): A positive sign was expected for this coefficient, because farmers' technical knowledge could enhance capacity building in farming aspect thus increase output due to proper management of the crop.

In the equation 2 above the relationship between the dependent and independent variables is non-linear. For the sake of estimation the equation was log transformed to become linear. The following linear model was specified for the purpose of statistical estimation of the parameter of the Cobb-Douglas production function:

$$\ln Q = \alpha^0 + \alpha^1 \ln AR + \alpha^2 \ln EX + \alpha^3 \ln PS + \alpha^4 \ln SP + \alpha^5 \ln CONTR + \alpha^6 \ln AP + \alpha^7 \ln TECH + e \dots \dots \dots (3)$$

The model is therefore, a linear regression and the model was then estimated by using Ordinary Least Square method to make sure that the model is not emanate from the basic assumption that the error term satisfies the basic stochastic assumption μ is $E(\mu) = 0$; $E(\mu^2) = \delta^2$ μ constant variance (homoskedasticity) $E(\mu^i \mu^j) = 0$ ($i \neq j$) serial independence.

Heteroscedasticity occurs when variance of the error term is not constant and in turn results into large standard errors of parameter estimates, depressed t-values and hence rejection of many hypotheses unnecessarily. The heteroskedasticity problem was taken care by transforming the equation to logarithmic form.

To take care of Multicollinearity problem, is known that increasing the sample size reduce the likelihood of encountering the problem (Gujarati, 1988). Thus in this study the sample

size is large enough to tackle the problem of multicollinearity. This is also supported by the coefficient of determination (R^2) which is quite high and also most of parameter estimates carry logical signs.

3.8.4 Discriminant analysis

This analysis was used to test the hypothesis that “*there is significant difference in terms of farm input used, farm output and income between contract and non contract farmers*” and also the test fulfilled the objective of assessing the impact of contract farming in industrialization of agriculture by comparing contract and non contract farmers.

Discriminant analysis, in general, is used to statistically determine variables that differentiate group, in this particular case the objective of discriminant analysis was to determine those variables that best discriminate between contract and non contract farmers in adopting farm technology. Similar analyses have been employed in many rural development researches. These include Temu (1994) and Kashuliza and Kydd (1996).

The linear discriminating function estimate has the following mathematical form

$$D = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_px_p$$

Where: D is the score of value of the canonical discriminant function

b_i s are canonical discriminant coefficients for independent variables

b_0 is the function intercept

x_i are selected attributes or independent variables

p number of independent variables

The canonical discriminant coefficients maximize the ratio of between groups and within groups sum of squares. Canonical coefficients are standardized in order to adjust for

unequal means and standard deviation and thus indicating the relative importance of the variables in the discriminating function (Tacq, 1997). By so doing the above equation becomes:

$$W = b_1x_1 + b_2x_2 + \dots + b_px_p$$

Where: W is the discriminant score, when the discriminant variables are standardized; other parameters remain as defined above.

Since the study objective was to investigate if there are socio-economic differences between contract and non contract farmers, then it was expected that the two groups must differ in W score.

There are several procedures to estimate the discriminant function, namely direct, hierarchical and stepwise method. The stepwise procedure using the minimization of Wilks' lambda, i.e. minimization of the ratio of within the group sum of squares to total sum of squares of the discriminant scores, was chosen in this study. The stepwise method was selected because of its exploratory nature, which is a combination of forward and backward selection of variables to enter the optimal discriminant function based on the minimum Wilks lambda, an acceptable tolerance level and the significance of a univariate F-test.

In discriminant analysis a linear combination of independent variables, sometimes called predictor variables, is selected and serves as a basis for assigning cases to the selected categories or groups to achieve the best separation Norusis (1986) cited by Temu (1994). In this study therefore important variables to explain farmers' socio-economic differences were selected. The variables were selected with regard to agricultural land, production and

income, demography, inputs and off-farm cash earning activities. The binary grouping used was whether farmers are in contract or non contract farming.

The overall significance of the discriminant function can be assessed through various statistical measures such as Wilk's lambda (λ), Eta and Eigenvalue coefficients. As lambda increases towards its maximum value of one, it reports progressively less discrimination. When Wilks' lambda (λ) is equal to one it means the group centroids are identical hence no group difference i.e. the group means do not appear to be different. When it is far less than one it indicates that there is greater discrimination i.e. group means appear to be different. Wilks' lambda is then converted into approximation of Chi-square and F distributions in order to tests its level of significance.

Socio-economic characteristic hypothesized to distinguish between contract and non contract farmers in adopting and increasing farm technology are presented in the Table 1.

Table 1: Discriminant analysis: Explanatory variables

Variable	Description	Codes
AGE (X_1)	Household head's age	
EDUCAT(X_2)	Household head year of formal education	
LAND(X_3)	Total land owned (ha)	
INPUSED(X_4)	Whether farmer used processed inputs	0 = No, 1 = Yes
PRICE(X_5)	Price offered for commodity under contract	
COMPRIC(X_6)	Price of competing crop	
ACCSEXT(X_7)	Access to extension service	0 = No, 1 = Yes
WELSTAT(X_8)	Respondent's perception of his/ her wealth status	
The binary group variable used:		
CONTR	Whether farmer is in contract farming or not	0 = No, 1 = Yes

CHAPTER FOUR

RESULT AND DISCUSSIONS

4.1 Overview

This chapter presents the results and discussion of the study. The chapter is divided into two main sections; the first section explains the institutional analysis, presenting assessment of contracting farming model found in study area, legal enforcement, role of contracting company, facilitating agent and the farmers. It also demonstrates price structure, farmers' view concerning contract farming and other issues relevant for institutional set up. The second section addresses economic analysis covering general household characteristics, marketing of produce, sources of sampled farmers' income, credit facilities and technical assistance in farming. Problems encountered by farmers in production and marketing of produce are also discussed. Then empirical results from linear regressions models and discriminant analysis are presented with the aim of testing stipulated hypotheses.

4.2 Institutional analysis

4.3 Institutional background

The contractual arrangement found in study area was mainly multipartite contract farming model, where private company Tanzania Food Quality Ltd made a simple production contract with small farmers producing sunflower under trading agent (Faida Mali Market Linkage) between parties. The contractual arrangement was initiated in 2001. The general agreement of this scheme is for farmers to grow sunflower and the contracting company to promote, purchase, process and market the produce to benefit both parties. That is, farmers would benefit by introduced with new crop, technical assistance in farming and ready market to sell the produce with reasonable agreed price between parties. The benefit to company is to be delivered with desired output in terms of quality, quantity and timely

with agreed price. However, the study found that there are some farmers who are not under contract farming but found them to be locked into local (informal) contractual relationship with the trader unwillingly. The main reason forcing these farmers into such situation is the lack of capital for agricultural activities. Giving their views concerning such situation, farmers complain that with such relationship most of time they are forced to sell the produce to these traders at very low price.

4.4 Formation system and legal enforcement

To reach this CA there was negotiation and consensus between farmers and company agent (Faïda Mali) through village government leaders. Farmers in this contractual relationship are registered either by simple registration or verbal agreement. The agreement between parties last for one growing season, from the date of signing to the end of economic harvest of sunflower production. If both parties are satisfied with the outcomes of the agreement it may be renewed for a further season, but there is no obstacle on either party to stop the renewal of the agreement. Members of this scheme comprise both farmers asked by agent through government village leaders to produce sunflower under contract and farmers asked the agent and leaders to produce sunflower under contract.

In governing the CA, there is no legal enforcement, instead there is mutual trust between parties that bypass formal legalities governing this relationship. The absence of formal legal enforcement poses many problems especially to farmers when the company fail to meet their obligations. For those farmers who found to be locked in contractual arrangement unwillingly with traders, found themselves disadvantageous, as there is no clear rule governing their lock in effect. In this relationship the trader has all decision concerning the sell of produce.

4.5 Conditions and requirements

4.5.1 Farmers' obligations

Farmers are obliged to possess not less than 0.25 ha, to form groups with twenty five percent (25%) of group member should be women and to sell the produce to contracting company only.

4.5.2 Sponsor's obligation

The key agreement for sponsor is to provide seeds and farming equipments, and to buy sunflower at the price announced at least two months before the start of new growing season.

4.5.3 Facilitating agent obligations

Facilitating/ promoting agent is the one who unite the two parties i.e. farmers and contracting company, hence he is answerable for the whole contract outcome. Facilitating agent must make sure that the terms of contract are beneficial for both parties. i.e. good price for farmers and desired quantity and quality to the sponsor. Therefore the role of facilitating/ promoting agent (Faida Mali Market Linkage) is to provide technical assistance and extension services to farmers, and teaching farmers simple accounting procedures for better records of their cash income.

4.6 Payments and deliveries

The delivery of produce to contracting company is done immediately after harvest. This reduces storage cost to farmers. Payment of the deliveries is done on spot or two weeks after delivery. The price for 1 kg of sunflower is announced at least two months before the growing season. The set price contracting farmers receive is normally higher relative to the open market price. The cost for the provided inputs is recovered on the set price of sunflower to farmers.

4.7 Problem encountered

The survey results reveal that the arrangement lacks a number of factors that could strengthen the agreement such as:

- **Quality standard-** regardless of the fact that the company is insisting on the quality of produce to be maintained but there is no clear information on how the standard should be. The failure of standardizing the produce tends to hamper the technical assistance given in the sense that both extension officers and farmers may not be keen in giving and receiving technical assistance. It could be appropriate if standard measure would be applied such as grades A, B or first class, second class and so on.
- **Production quota-** field survey found that there is no quota specification under the studied scheme. However, specifying quota is a fundamental criterion in a contract farming venture (FAO, 2001). Production quota enables farmers to use their resources efficiently in producing hence obtained required quality and quantity. This is because overproduction can end up with poor produce due to farmers forcing more production with little resources provided by contracting company. Also lack of specifying quotas may make some farmers to produce below the standard, as they can use few resources with the desire of cultivating larger area than required.
- **Insurance arrangements-** field survey reveals that there are no insurance arrangements to compensate the parties in an event of loss. Insurance arrangements provide some confidence both to farmers and company. This is because both farmers and the companies are sure to cover some cost in case of any unexpected

results (drought, pest attack etc). This could further create trust between parties that is essential in transacting.

4.8 Respondents' profile

The study covered three wards namely Arri, Mamire and Dabil in Babati, Manyara Region. A total of 227 farmers were sampled of whom 105 farmers were contract farmers and 122 were non contract farmers. About 24.7% of the farmers were from Arri of which 13.7% were contract farmers and 11.0% were non contract farmers. About 35.2% of the farmers came from Mamire where only 6.6% were contract farmers and the remaining 28.6% were non contract farmers. A large percent (40.7%) of farmers were from Dabil of which 26.7% and 14% were contract and non contract farmers respectively. The large number of farmers from Dabil can be explained by the fact that the ward is far from town centre, thus farming is major economic activities for the dwellers compared to Mamire and Arri where off farm activities is much practised. Likewise, the high percent (26.7%) of contract farmers from Dabil is due to the same factor; because contract farming favours farms to be located far enough as long as the climate is favourable to crops so as to reduce the temptation to farmers to sell produces to third part (extra-contractual sell) (FAO, 2001). Table 2 shows the distribution of respondents by location and status.

Table 2: Babati District: Distribution of respondents (contract vs non contract farmers) by wards (n=227) in percentage

Ward	Contracting farmers		Non contract farmers	
	Written	Informal	No	Total
Arri	10.1	3.5	11.0	24.6
Mamire	0.0	6.7	28.6	35.2
Dabil	11.5	14.5	14.2	40.2
Total	21.6	24.7	53.8	100.0

4.8.1 Social economic characteristics of farmers

Social economic characteristic have a bearing on the farmers' production decisions and resource allocation. They determine human potential to produce and capacity to change production practices and technology in this ever-changing social and economic environment (Ngailo, 1993).

In Table 3 survey results indicate that 66.7% and 64.8% of contract and non contract farmers are aged between 26 and 45 years respectively, while 14.3% and 12.3% of contract and non contract farmers were between 56 years and above respectively and only 4.8% of contract farmers and 4.1% of non contract farmers were between 16-25 years.

The age of respondents ranged from 20 years to a maximum of 80 years with the mean of 41 years, for non contract farmers and from 23 to 80 years with mean of 42 years for contract farmers. These findings show that majority of farmers fall between the age group of 26-45 years who are energetic enough, capable to undertake agricultural production activities.

Table 3: Babati District: Summary of sampled household socio-economic characteristics

Variable measured	Contracting farmers		Non contracting farmers		Significance (t-test/ χ^2)
	Frequency	Percent	Frequency	Percent	
Average age of household head	42.3	-	41.57	-	0.674 ^{n.s.}
16-25	5.0	4.8	5.0	4.1	
26-45	70.0	66.7	79.0	64.8	0.146 ^{n.s.}
46-55	15.0	14.3	23.0	18.9	
56 and above	15.0	14.3	15.0	12.3	
Total	105.0	100.0	122.0	100.0	
Gender of household head					
Male	103.0	98.1	114.0	93.4	0.089 ^{n.s.}
Female	2.0	1.9	8.0	6.6	
Total	105.0	100.0	122.0	100.0	
Marital status					
Married	103.0	98.1	111.0	91.0	0.089 ^{n.s.}
Single	2.0	1.9	2.0	1.6	
Widowed	0.0	0.0	5.0	4.1	
Divorced	0.0	0.0	4.0	3.3	
Total	105.0	100.0	122.0	100	
Education level attained					
No formal education	14.0	13.5	16.0	13.0	
Primary	83.0	78.8	94.0	77.0	0.190 ^{n.s.}
Secondary	8.0	7.7	7.0	5.8	
College and above	0.0	0.0	5.0	4.2	
Total	105.0	100.0	122.0	100.0	
Average household size	6.6	-	6.23	-	0.678 ^{n.s.}
Av. household farm size (ha)	7.2	-	12.3	-	0.009 ^{**}
Household farm distribution (ha)					
Sunflower	1.7	23.6	3.4	27.6	0.030 [*]
Maize	3.0	41.6	4.9	39.8	0.690 ^{n.s.}
Other crops	2.5	34.7	4.0	32.5	0.080 ^{n.s.}
Occupation					
Farming & Livestock keeping	85.0	81.0	96.0	79.0	0.743 ^{n.s.}
Farming & Trading	16.0	15.0	31.0	25.0	0.059 ^{n.s.}

Note: significance level of 1% and 5% are indicated by ** and * respectively, while n.s. is not significant difference.

The results also indicate that age had no influence in categorize contract and non contract farmers. Furthermore, the results show that 98.1% of contract farmers are married and male head while for non contract farmers is 91% and 93.4% respectively.

Regarding education, results show that 78.8% of contract farmers and 77% of non contract farmers had attended primary education. The results also show that farmers with no formal education were 13.5% and 13% of contract and non contract farmers respectively. This implies that majority of surveyed household heads have basic education enough for them to seek or receive better agricultural production and marketing techniques available from different sources such as extension agent, publications and mass media. Also education doesn't seem to influence farmers to be in contract or non contract farming.

Regarding family size, results show that the average number of individuals per household is six for both contract farmers and non contract farmers. These observations indicate satisfactory labour force per household.

With the reference of farm size, contract farmers had an average farm size of 7.2 acres while non contract farmers had an average of 12.3 acres. Although there is significant difference ($P < 0.01$) in farm size owned between contract and non contract farmers but the distribution of land among different crops is insignificant except for sunflower production ($P < 0.05$).

4.8.2 Major sources of income

Farmers were asked to state the major sources of income for their household. Table 3 shows that 81% of contract farmers' income comes from farming and livestock while it is 79% for non contract farmers. Farming and trading however is the second most important source of income, contributing 15% and 25% for contract and non contract farmers respectively. These findings suggest that non contracting farmers are mostly engaged in farming and trading compared to contract farmers, however this difference is not

statistically significant. The likely justification for this is the location (near to town) where high percent of non contract farmers come from, therefore faced by larger number of buyers.

4.8.3 Marketing of produce

The marketing of produce with respect to both time and place has a profound effect on farmer's income, as these have a direct bearing on transaction costs (North, 2000). Timely marketing involves search for buyers to buy produces/ to get paid back or both which is costly. Late selling of produces due to absence of buyers normally increase additional costs to farmers, like storage facilities. Also, late payment for produce sold, makes difficult for farmers to meet their production costs in farming and affect farmer's income. Similarly, place of selling and the frequencies the produce is sold affect income as they increase the transaction cost (Sartorius *et al.*, 2002). To see how farmers handle the issue of transaction costs, the study investigated the time of selling produce, place where the produce sold, number of time the produce sold and other measure associated with transaction costs such as bargaining condition, payment condition and selling conditions.

4.8.3.1 Time of selling produce

Time of selling produce affects farmer's income due to price variations with time. Normally price of produces are very low at harvesting period. In Babati harvesting period is from August to early October. During this period the price for sunflower is 7000 Tshs per bag. Towards the beginning of new season the price shoot to 12 000 Tshs per bag (Babati Agricultural Office). However the need of immediate cash and high cost of storage force some farmers to sell their produce soon after harvest. Table 4 shows different time that sell have been done

Table 4: Babati District: Time of selling most of produce

Time	Contracting		Non Contracting		Total	
	farmers		farmers			
	N	%	N	%	N	%
Already had a deal before	48	45.6	11	9.0	59	25.9
Immediately after harvesting	43	41.0	68	55.6	111	48.9
Wait for higher price	12	11.4	38	31.0	50	22.0
When faced with a problem	1	1.0	3	2.2	4	1.6
Close to the begin of new season	1	1.0	3	2.2	4	1.6
Total	105	100.0	122	100.0	227	100.0

Notes: N are counts, % are row percent.

Table 4 shows that, 45.6% of contracting farmers had a deal before harvest, while 41% sell immediately after harvest, 11.4% wait for higher price and only 1% sell when faced with a problem and in the beginning of new season. Results further show that 55.6% of non contract farmers sell their produce immediately after harvest, while 31.0% wait for higher price and only 9% had a deal before harvest. From these observations, it is obvious that contract farming can be gainful from the fixed price they get only if the price in open market is below the set price, otherwise, where alternative outlets exist with higher price, farmers may consider fixed price arrangements to be disadvantageous. Therefore, for successful contract farming a sponsor should establish pricing structure that accounts change in local markets. For non contract farmers whose majority sell the produce depending on the problem faced, the situation is even worse, the circumstance more often lowers their bargaining power and may end up selling their produce at even very low price.

4.8.3.2 Place of sale

Place of sell can be used as a measure of assessing market performance. This is due to price variations as a result of different buyers in different places (Ashimogo, 1994). Selling at the farm is more likely to end up having limited number of buyers, consequently lower bargaining power of the farmer. Therefore, as a means of improving market access it is necessary to look for market channels. Table 5 shows that, majority of contract farmers sell their produce on farm. This was expected for those having written contract as the contracting company harvest and collect the produce (sunflower). However, smaller proportions of contracting farmers mainly those under informal contract sell their produce at the local market, wholesale and at their home as their contracting agents are not very strict on where they sell their produce. Results also show that, the commonest place for produce selling for non contract farmers is at their home as this accounted for 63.3%. Another 22% and 11% sell the produce at the farm and local market in the village respectively.

Table 5: Babati District: place where sale take place

Place	Contracting farmers		Non Contracting farmers	
	N	%	N	%
Farm	73	82.0	24	22.0
Local market	7	7.9	13	11.9
Wholesale	3	3.4	3	2.8
Home	6	6.7	69	63.3
Total	89	100.0	109	100.0

χ^2 statistically significant at 0.05

These observations show that most of non contract farmers sell their produces in un-official market place. However the choice of on the point of sells by non contract farmers is linked by several factors such as high transportation cost, no other better alternative and lack of reliable market place. These results alert the need to increase attention to the role of marketing institution in supporting commodity exchange and effectively reduce

transaction costs.

4.8.3.3 Payment condition and time

Payment condition and time of pay can affect farmer's income as they are integrated in the transaction cost. Credit and late payment can mean more cost incurred by farmers on the process of being paid. Table 6 reveal that 79.8% of contract farmers are paid on the same day and the remaining 20.2% are paid later, whilst 94.6% of non contract farmer are paid at the same day and only 5.4% are paid later. However, all payments for both farmers are paid in cash. Results show that contract farmers (written contract) are the ones who take time to be paid, but despite being paid late they did not complain due to the fact that, the situation is stated clearly in their agreement. However, for non contract farmers who are paid immediately, they complain of low level of trust between non contract farmers and the buyers of produce. The low level of trust between transacting parties normally increases transaction cost.

Table 6: Babati District: Time taken to pay for produce sold

Time	Contracting farmers		Non Contracting farmers	
	N	%	N	%
Same day	71	79.8	105	94.6
Later	18	20.2	6	5.4
Total	89	100.0	111	100.0

4.8.4 Agricultural support services

4.8.4.1 Credit facilities

Table 7 shows that only 35.2% of contract farmers and 40.2% of non contract farmers had access to credit facilities, leaving behind a substantial proportion of farmers without credit facilities. Family/friends and Saccos are the most important financial source for both contract and non contract farmers. These findings reveal that, despite the obvious need for financial services for agricultural producers, credit facilities for both contract and non contract farmers are very poor. These results conform to Goodland *et al.* (1999) that access to financial services and in particular to funds for crop production is a severely limiting factor, that slows down input use (improved seed and seasonal labour) and output marketing (for example storage, transport and household level processing). Furthermore, the survey results indicate that out of 34% of contract farmers who had access to credit, only 18% applied for credit in 2004 - 05 to finance production and marketing activities while for non contract farmers was only 10.7%.

Table 7: Babati District: Sources of credit facilities

Source	Contracting farmers		Non Contracting farmers	
	N	%	N	%
Commercial bank	0	0.0	4	3.3
Buyer of produce	1	1.0	4	3.3
Input salesman	1	1.0	0	0.0
Saccos	14	13.3	9	7.4
Government	3	2.9	4	3.3
Family/friends	14	13.3	24	19.7
NGOs	4	3.8	4	3.3
No any source	68	64.8	73	59.8
Total	105	100.0	122	100.0

Note: $\chi^2 = 17.175$, $df = 8$, Significance = 0.028, $N = 227$

Table 8 shows the main reasons reported by both contract and non contract farmers for not applying for credit. These are lack of information (31.4%), lack of guarantee (18%), and fear (risky) of loosing owned assets (17%); Also, 5.2% and 3.1% say the service is too

expensive and bureaucratic respectively.

Table 8: Babati District: Reasons for farmers not to apply for credit

Reasons	Contracting		Non Contracting		Total	
	farmers		farmers		N	%
	N	%	N	%		
Lack of endorsement/guarantee	15	17.6	20	18.3	35	18.0
Risky to acquire debt	6	7.1	28	25.7	34	17.5
Lack of information	38	44.7	19	17.4	33	17.0
Expensive	14	16.5	29	26.6	67	34.5
No service offered around	10	11.8	9	8.3	23	11.9
Others	2	2.4	4	3.7	6	3.1
Total	85	100.0	109	100.0	194	100.
						0

Nevertheless, though credit (fund) was not well accessed, Table 9 shows that, 80% of contract farmers received credit in kind compared to only 6.6% of non contract farmers. Also, 50.5 % of contract farmers received technical training compared to only 32.8% of non contract farmers. Therefore, at this juncture these findings can't jeopardize the role of contract farming, as there is promising future for small scale farmers.

Table 9: Babati District: Access to agricultural support service

Service	Contracting farmers		Non Contracting farmers	
	N	%	N	%
Credit (in kind)				
Yes	84	80.0	8	6.6
No	21	20.0	114	93.4
Training				
Yes	53	50.5	40	32.8
No	52	49.5	82	67.2

4.8.5 Respondents' views concerning contract farming

4.8.5.1 Farmer's perceptions to join contract farming

To assess the viability of contract farming in the study area, the study looked at the number of farmers wishing to produce and market under contract. Table 10, shows that 62.6% of non contract farmers wish to join into contract farming scheme in the coming season, 28.5% had no intention to do so, while the remaining 8.9% said they don't know. This shows that contract farming is accepted by majority of farmers. Furthermore, the study looked at the reasons why farmers who wish to be in contract never produce under contract before, two major reasons being given are not knowing buyers that offer contract (77.2%) and not having enough education concerning contract farming (46.8%).

Majority of farmers who said they don't want to produce under contract mentioned three main reasons. Firstly they are afraid of not being able to produce enough quantity, secondly they do not trust the contractor and finally they are able to earn more money by producing and marketing out of contract as shown in Table 10.

Table 10: Babati District: Farmers views on contract

Farmer idea	Number	Percent
Wish to be under contract		
Yes	77	62.6
No	34	28.5
Don't know	11	8.9
Reasons why never grow under contract		
Don't know any buyer that offer contract	61	77.2
No contract for the crop grown	17	21.5
Buyers are too far	2	2.5
No enough knowledge concerning contract	37	46.8
Reasons why don't want contract		
Don't trust contract buyers	23	65.7
Can earn more money without contract	22	62.9
Cannot produce enough quality needed	27	77.2
Others	3	8.5

4.8.5.2 Contract farmers perception on contract farming

Table 11 results show contract farmers perception on contract farming. For those who approve contact farming it was observed that majority had multiple reasons as to why contract farming is “Good”. Three most given reasons were; being provided with technical assistance, assurance of market and paid good price of their produce. The remaining few did say either contractual arrangement “had no effect” or it was “bad”. The given reasons are shown on Table 12.

Table 11: Babati District: Farmers' perception on the contractual relationship

Perception	Number	Percent
Good	73	72.3
Has no effect	13	12.9
Bad	6	5.9
Don't know	9	8.9
Total	101	100.0

Table 12: Babati District: Farmers' views on why they prefer contract farming

Views	Number	Percent
Pay good price	25	34.2
Guarantee price	13	17.8
Input credit	10	13.7
Technical assistance in production	63	86.3
Assured market	62	34.9

% > 100 i.e responses are not mutually exclusive

4.8.5.3 Income differences under contractual arrangements

In order to see the viability of contract farming, it was worth to look at income changes under this arrangement. Farmers were asked if there are income changes since started to produce under contract. Table 13 shows that 58.2% say there is small increase in income, while 23.5% say they have large increase in income as a result of producing under contract whereas 4.1% and 3.1% experienced small decrease and large decrease respectively. Other respondents, 11.1% say there is no change in income observed as a result of producing under contractual arrangements. This observation suggests that CF increased income levels of the majority of farmers.

Table 13: Babati District: Ways income have changed under contract

Changes	Frequency	Percent
Large increase	23	23.5
Small increase	57	58.2
Small decrease	4	4.1
Large decrease	3	3.1
No changes	11	11.1
Total	98	100.0

4.9 Effect of contract farming in transaction cost, and on determining yield levels

4.9.1 Effect of contract farming in reducing transaction cost

Effect of contract farming in reducing transaction cost was determined using regression analysis. The results of regression are presented in Table 14. The F-value (59.198) to test R^2 of the model was statistically significant ($P < 0.01$). This implies that the regression model was strong to explain the relationship between dependent and independent variable. The explanatory power (Adjusted R^2) of selected variable was 0.513 implying that 51.3% variation in dependent variable (contract or spot market) was explained by independent variables included in the model.

Results in Table 14 show that the entire variable had the expected sign showing that, transaction cost can be reduced if frequency of selling is minimal, asset specificity and uncertainty are high therefore creates mutual dependence thus there is possibility of hold up and reduce transaction cost over time. The independent variables are statistically significant ($P < 0.01$), except for the variable uncertainty that was statistically insignificant. Probably relatively low level of uncertainty is a results of some drawbacks found in this contractual arrangement. Also uncertainty of supply can be affected by the price of sunflower from other regions.

Table 14: Babati District: Regression results for effect of contract farming in reducing transaction cost

Variable	Beta coefficient	Std.error	t-statistic	Significance
Constant	0.698	0.071	9.817	0.000***
Number of time selling produce (frequency)	-0.457	0.022	-8.123	0.000***
Trust to the buyer (uncertainty)	0.011	0.006	0.196	0.845 ^{n.s.}
Asset specificity	0.194	0.069	3.053	0.003***

Note: dependent variable is mode of transacting (whether farmer is in contract or not)

R², Adjusted = 0.513

F-ratio = 59.918***

*** = Significant at 1%

n.s. = no significant difference

4.9.2 Effect of contract farming on yield levels

Table 15: Babati District: Regression result on effect of contract farming in yield levels

Variable	Coefficients	Std.error	t-test	Significance
Constant	99.767	96.567	1.033	0.305 ^{n.s.}
ln AR	0.746	8.067	9.514	0.000***
ln EX	0.216	1.896	2.137	0.036**
ln SP	-0.157	26.080	-2.020	0.047**
ln PS	-0.011	0.006	-0.132	0.895 ^{n.s.}
ln CONTR	0.198	30.233	2.214	0.030**
ln AP	-0.025	0.830	-0.308	0.759 ^{n.s.}
ln TECH	0.065	22.407	0.835	0.407 ^{n.s.}

Adjusted R² = 0.57

F-value = 13.691***

Note: Dependent variable is output per acre

*** = Significant at 1%

** = Significant at 5%

n.s. = No significant difference

From Table 15 show that, the independent variables explain about 57% of variation in output (sunflower) per ha. Farm size (area under cultivation) has a positive coefficient as expected and was statistically significant ($P < 0.01$). This implies that output increased as area under sunflower increases.

Experience (years) in cultivating sunflower has a positive relationship with amount of sunflower produced and statistically significant ($P < 0.05$). This indicates that years spent in cultivating sunflower increases output per ha, probably due to long experience farmer could conquer various obstacles that reduce amount of output.

Market channel (farm) was statistically significant ($P < 0.05$) and has negative sign as expected, implying that if market take place on the farm it is likely that the farmer will earn less, bearing on mind that on farm always there are limited number of buyers of produce.

Price of sunflower is not statistically significant and has negative coefficient, which is not in agreement with what was hypothesized. Factor that can explain these observations is possibly the price of other cash crops in the area, which are always higher than the sunflower price. Therefore considering other cash crops one is not willing to grow/produce sunflower.

As expected, Contract element (dummy), has a positive sign and significant ($P < 0.05$). Implies that, be in contract output per ha will increase due to increase in technical aspects in managing crop, use of selected seeds, and ready market for output.

Advance knowing the price of main input used in production has negative sign. Here negative or positive sign was expected, however the variable was not statistically significant. The negative sign may be interpreted as due to continuing increasing of input price, farmer tend to reduce area under cultivation and hence reduce output per ha.

Technical knowledge; education was used as proxy for technical knowledge, the variable has positive relationship to output as expected, indicating that more educated farmers have ability to produce more sunflower per ha compared to less educated farmers due to the former having more ability to think in resource allocation and utilization than the later. However the variable is not statistically significant. Insignificance is possibly due to majority of farmers who interviewed possess the same level of education.

4.10 Results of discriminant analysis

In order to test the hypothesis that “there is significant difference in terms of land owned, farm input used, farm output and income between contract and non contract farmers” eight variables were subjected to stepwise discriminant analysis. Results in Table 16 indicate that out of eight variables entered, five variables were significant in distinguishing contract and non contract farmers. The five variables are total land owned (LAND), input used (INPUSED), price of sunflower (PRICE), price of competing crop (COMPRIC) and access to extension service (ACCSEXT). The F-statistic and significance values in Table 16 are from one-way ANOVA computed for each variable individually. Since we have two groups contract and non contract farmers, the F-statistic is equivalent to the square of t-statistic for a two-sample pooled variances t-test. F-statistic is a ratio of between groups variability to the within groups variability. Input used (INPUSED), price of sunflower (PRICE), price of competing crop (COMPRIC) and access to extension service (ACCSEXT) were found to be significant at 10% level whereas total land owned (LAND) was significant at 5% level.

Table 16: Test of Equality of Group Means; unvaried analysis

Discriminating variable	Wilks' Lambda	F	Significant
AGE (X ₁)	0.999	0.146	0.703 ^{n.s.}
EDUCAT (X ₂)	0.998	0.342	0.559 ^{n.s.}
LAND (X ₃)	0.970	6.986	0.011*
INPUSED(X ₄)	0.850	39.574	0.000**

PRICE (X ₅)	0.845	41.222	0.000**
COMPRIC (X ₆)	0.911	21.864	0.000**
ACCSEXT (X ₇)	0.572	167.427	0.000**
WELSTAT (X ₈)	0.988	2.633	0.106 ^{n.s.}

* Significant at 5% level

** Significant at 10% level

n.s. No significant difference

Table 17 shows sample means of variables where the relationship of variables found statistically significant in Table 16 can be determined between groups. From this output, it can be seen that mean for price of sunflower and price of competing crop are higher for contract farmer as compared to non contract farmers, indicating a greater importance of these variables to contract farmers. Whereas the mean for land owned is higher for non contract farmers.

Mean comparison for access to extension service and input used were irrelevant and inconsequential as these variables were included as categorical variables.

Table 17: Babati District: Variables' Group Statistics

Category	Variables	Mean	Standard deviation
Contract farmers	Land	6.95	10.61
	Price of sunflower	12490.86	1865.30
	Price of competing crop	19425.94	3986.88
Non contract farmers	Land	10.05	5.99
	Price of sunflower	10729.17	2258.62
	Price of competing crop	16747.11	4845.94
Total	Land	8.61	8.89
	Price of sunflower	11547.65	2233.62
	Price of competing crop	18023.89	4606.39

To identify the rationale of variable in the model, it is important to look at inter-correlation among variables (pooled within group matrices correlation between variables). Almost all variables show a weak correlation i.e. $r < 0.5$. Some variables seem to be weak and negatively correlated as shown in the appendix 3. This signifies the rationale for including the variables in the model, as there is no serious inter-correlation among variables. In addition to this finding, it is also necessary to determine the usefulness of independent variables in predicting dependent variable. This was done by examining the variable in structure matrix, as shown in the Table 18.

The structure matrix presented shows the correlation of each variable with discriminant function. The results show the factor structure matrix in descending order in accordance with usefulness of each variable in the function. Four variables were found to be useful in discriminating the group, i.e. access to extension service, price of sunflower, use of input and price of competing crop.

Table 18: Structure matrix

Discriminating variables	Function
Access to extension services	0.798
Price of sunflower	0.396
Input use	0.388
Price of competing crop	0.288
Wealth status of the farmer given income ^a	0.091
Age ^a	0.060
Land owned ^a	-0.013
Years of formal education ^a	0.001

^a – Variable not used in the analysis

Other variables found to have far less usefulness compared to those three variables, and in stepwise procedure were not included in the model, indicating that they are not important in discriminating the contract and non contract farmers.

An overall assessment of the discriminant function in relation to discriminating variables was made using the Eigenvalue, canonical correlation coefficient, Wilks' lambda, chi-square and its significance level.

Results reveal that, variables identified by stepwise procedure were significant discriminating the group adequately. This is supported by the canonical correlation coefficient of 73.5%, Eigenvalue of 1.175, Wilks' lambda of 0.46 and chi-square coefficient of 172.452 as presented in Table 19, which shows that the function is significant at 1% significance level. Eigenvalue is the ratio of the between groups sum of square to the within groups or error sum of squares. The canonical correlation measures the association between the discriminate score and the groups. Since the canonical correlation coefficient was 0.735, it indicates that the association between the discriminate score and the groups was 73.5%.

Wilks' lambda is the proportion of the total variance in the discriminate scores not explained by differences among the groups (Tacq, 1997). In this case, it is only 46% (Wilks' lambda 0.46) of the variance of the variables included in the model is not explained by group differences. Implying that the variables included in the model mostly explained the variance of group differences, suggesting that the two groups differ significantly. In addition to that, the group centroid (average discriminate score) is +1.158 and -1.005 for contract and non contract farmers respectively. This confirms further that the two groups differ, because the groups are distinguished if their discriminate score differ.

Table 19: Discriminant function: A grand analysis results

Parameter	Value for the whole sample
Eigenvalue	1.175
Canonical correlation coefficient	0.735
Wilks' lambda	0.460
Chi-square	172.452

Note: Significance level at 1%

Since the objective of discriminant analysis is to identify variables that optimally separate cases into pre-determined binary groups i.e. the likelihood of an individual being a contract or non contract farmers. The results in Table 20 indicate that discriminant function would correctly classify 86% of actual contract farmers in contract farmers group and 84% of actual non contract farmers in non contract farmers group. That is, on average 85% of respondents (cases) are correctly classified and only 15% of these cases were misclassified. Implying that, more than two third are correctly classified. These results suggest satisfactory level of discriminant and success of identified variables in providing useful means of predicting the probability of farmers being contract or non contract

farmers.

Table 20: Classification results for contract and non contract farmers

		Predicted group membership*	
		Contract	Non contract
Contract	105 (100%)	90 (85.7%)	15 (14.3%)
Non contract	122 (100%)	19 (15.7%)	102 (84.3)

As seen earlier, different variables were chosen to be included in the discriminant function. Results of the classification analysis tell us that different socio-economic variables were found to influence differently contracts and non contracts farmers. However this differentiation is not in a clear-cut fashion. This means that there is no complete isolation or separation of farmers in terms of the selected socio-economic variables. That is, some farmers in group 1 (contract farmers) would belong to group 2 (non-contract farmers) and vice-versa.

It can be concluded from discriminant analysis that, there is significant difference in the use of farm input, farm output and farm income between contract and non contract farmers. The difference was largely attributed by access to extension service, farm input used and price of sunflower. This implies that presence of contract farming had an impact on farmers. Farmers who engaged in contract farming had more access to extension services, used higher level of input and had higher level of farm income effected by high price of sunflower offered by contracting company.

With these results, the role of agribusiness firm in extending contractual benefit to small scale farmers can therefore be justified. However the outcome is not adequate because of shortfall encountered in initiating contract schemes. There is a lot to be improved in contractual arrangements, so as to have an expected outcome on the productivity of small scale farmers. Several suggestions have been made in recommendation section in chapter

five.

4.11 Problem faced by farmers in productive chain

4.11.1 Productive chain-input

In productive chain input, study aimed at identifying problem facing farmers in the use of input in production. Field results show that 66.3% (n=110) of farmers used non processed inputs (local seed and organic manure) and remaining 33.7% (n=56) used processed inputs (certified seeds, fertilizer and pesticide). For those using local inputs, majority had no problems in using these inputs. Notably, those who used processed inputs both contract and non contract farmers experienced several problems mainly being high price of the input, lack of technical know how in using the input and high transportation cost as presented in Table 21. However for contract farmers, problem in technical skill was not thought to be the case, possibly it was for those under informal contract with mainly traders who don't provide such services at all. Farmers enter in this contractual choice mainly due to monetary purpose.

Table 21: Babati District: problem concerning the input used (n=166)

Problem	Contract farmers		Non Contract farmers	
	N	%	N	%
High price	20	29.0	83	85.6
Lack of technical skill	17	24.6	47	48.7
Poor extension services	6	14.5	0	0.0
Unavailable	7	10.1	2	2.1
Poor quality	4	5.8	5	5.2
High transportation cost	24	34.8	10	10.3
Equipment shortage	8	11.6	0	0.0

4.11.2 Productive chain - output

Table 22 shows problems faced by farmers concerning their output. The major problems in productive chain output facing contract farmers are draught, pest attack and little harvests in decreasing order of frequency, while for non contract farmers the trend was draught, low price of produce and little harvest. Furthermore, it was of particular interest to note that unfair measuring unit was reported by non contract farmers 3 times more often as compared to contract farmers.

Table 22: problem concerning output (n=431)

Problem	Contract farmers		Non Contract farmers	
	N	%	N	%
Drought	46	40.7	44	25.6
Diseases	2	1.8	15	8.7
Pest attack	26	23.0	28	16.3
Low price	12	10.6	40	23.3
Unfair measuring unit	3	2.7	12	7.0
Little harvest	20	17.7	30	17.4
Other	4	3.5	3	1.7

4.12 Chapter summary

Results from Regression analysis (Linear Probability model) have showed that the role of CF in linking small scale farmers with agribusiness firm is feasible and is of increasing importance to small scale farmers in Tanzania. This is due to the fact that CF found to have an impact on reducing transaction cost to farmers ($P < 0.01$), which is the key to economic performance. In estimating yield level, results from Cobb-Douglas production function showed that CF is an important element in increasing farm productivity to farmers ($P < 0.05$). This is because contract farming as a package consists of a number of services such as credit, technical advice, marketing facilities that are essential in determining farm output.

Also from Discriminant analysis, results show that there is significant different between contract and non contract farmers in input use, farm output and income ($P < 0.01$). This made the study fail to reject the hypothesis that there is significant difference in the use of farm input, farm output and farm income between contract and non contract farmers. The study found that contract farmers had more access to specialised input, extension services, and higher price of output.

Also the results show that socio economic and demographic variables such as age, education, marital status, and family size had no significant influence in distinguishing between contract and non contract farmers, however farm area seems to influence between contract and non contract farmers significantly.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

The main objective of the study was to evaluate the contract farming schemes practiced in Manyara Region Tanzania by mainly small-scale farmers with the primary objective of contributing towards the design of small farm agribusiness partnership model in order to promote industrialization and transformation of agriculture for small-scale farmers in Tanzania. Specifically the study concentrated on the model of contracting farming practiced, performance and shortcoming of the model. The survey results provide supplementary information for strengthening the contract farming under study and in Tanzania at large. The study ultimately aimed at giving recommendations on how to improve contract farming by giving suggestions useful in formulation of the policies and means of strengthening it more.

5.1 Conclusion

5.1.1 Description of contractual arrangement found in study area

The main type of contractual arrangement found in study area is multipartite contract farming model. Results of the field survey confirm that majority of the farmers prefer contractual arrangement. The main reasons include being provided with technical assistance, guarantee market and good price of produce. However the study found that the contract farming in the study area failed in a number of operational parameters. Poor supervision of farmers' production activities by extension workers or contract agent, left farmers having difficulties to produce the crops to the standard required. Other major problem was late supply of the agriculture inputs forcing farmers to use local input with poor quality, resulting in less harvest. Also high transport cost forces farmers to turn into use of local input.

5.1.2 Impact of contract farming on transaction cost

Results obtained confirm that contract farming is the right mode of transacting due to its ability of reducing transaction cost to farmers. Those farmers in the contract farming apart from being provided with easy access to market their frequency of selling was highly reduced making their transaction cost lower compared to non contract farmers. In addition to that, there is high degree of trust between contract parties, therefore spend less time and resource in negotiating and monitoring the project thus reduce transaction cost. In addition to reducing transaction cost trust also enables the participants in an exchange relationship to share important confidential information and therefore encourage making the relationship specific- investments.

5.1.3 Effect of contract farming on yield levels

In estimating productivity to farmers, Cobb Douglas production function reveals that contract farming is an essential element that help in linking farmers with the most important factors that could boost up their production. These factors are credit, training facilities, improved inputs and ready access to market. This was significant in improving productivity at 5% level of significance.

5.1.4 Differences between contract and non contract farmers in farm input use, farm output and farm income

Discriminat analysis shows that there was significant difference in farm input use, farm output and farm income between contract and non contract farmers. This implies that contract farming enabled farmers to adopt farm technology, as there is an increase use of farm input and access to extension services. Contracting farmers were given input as credit; therefore increase use of improved input resulted in higher farm output and farm income.

Therefore, based on this finding, it is concluded that contract farming is an important catalyst to adoption of technological innovation at this age of agricultural industrialization and market liberalization, in order to transfer agricultural to more commercial enterprise for small scale farmers in Tanzania. However, CF as an institution experiences some drawbacks. Comments are made in the next section to strengthen the working of this institution.

5.2 Recommendation

In the light of major findings from this study the following recommendations are made towards improving contract farming in Tanzania.

5.2.1 Contract enforcement

Contract farming arrangements most often involve disputes, which at the end leave one or both side disadvantaged. Therefore, it is important for government to take the role of enforcing contract between buyers and farmers by mediating the disputes between them. This will significantly contribute towards the use of contract farming and more participation of many small scale farmers in contract farming.

5.2.2 Quality control

Quality standard influence market and its expansion, therefore contractor should develop a clear quality control and monitoring system suitable for specific crop. Farmers should thus be informed on the importance of grading their produce and assisted in establishment of standard. Government may also assist in establishing standard

5.2.3 Production quota

Provisions of production quota should be clearly specified before each production period, as they are important in contract farming ventures. The quotas should explicitly specify the quality and quantity of the produce required, as production below the specified standards can have serious effect to both farmers and contractor. Overproduction as seen by the contractor might create a market problem to both of them, while underproduction might lead to loss of trust in business between farmers and contractor and contractor and the final markets outlets.

5.2.4 Monitoring human resources

Human resources used in contract farming i.e the management and field staffs of the contractor as well as that of the farmers needs to be continuously monitored. Extension staffs must be well supervised so that they should be no the cause of low or substandard production. Farmers need to be supervised and assisted throughout the production period and responsible for violation of the contract terms, and not simply pin down the farmers whenever things go wrong in the production.

5.2.5 Insurance arrangements

Agriculture investment quite often involves risk taking. The standard agribusiness approach to tackle against quantity shortfall is crop insurance. The most likely reasons for crop failure are poor crop management, climatic calamities, pest epidemic, market collapse and price fluctuation. Therefore it is important for contract farming to run and promote crop insurance scheme. However before advising farmers to consider joining the insurance, a detailed risk analysis should be done to evaluate the economic advantage of insurance against the specific risks applicable to particular crop.

5.2.6 Provisions of other services

Since primary objective of any investment in contract farming is profit making relative to its business. Therefore companies entering into contract with small scale farmers must devote a number of services that can enhance the desired success. The key services are:

- Adequate communication system that includes road, transport, telephone and other telecommunication services that are major pre-condition for agricultural investment in rural areas. This is essential to ensure that farm produce can be easily transported and that inputs can be delivered to farmers in time without affecting production.
- Input availability; Sponsors need to be sure that they will be able to organize the supply of all necessary inputs for the farmers. All inputs should be identified and ordered well in advance. Failure to have ready access of these inputs can cause serious disruption to the production chain and can result in serious financial losses for all parties.
- Investment in irrigation; Following drought as a major problem in our country, government and agribusiness firms should invest in research and stimulate innovation in micro-irrigation technology.
- Government should take developmental role in facilitating the linkage between farmers and exporters or other buyers, by organising farmers groups, organising forum with agribusiness firms, establishing ground rule for farmer-buyer contract and disseminating important information about buyers. This is because the existences of one buyer create monopoly and often undermines the competition and curtails farmers' bargaining power.

5.3 study limitation and area of further research

5.3.1 Study limitation

This research was limited by the nature of questionnaire used. The questionnaire was too long. Due to the explanatory nature, the study topic necessitated a collection of a wide range of quantitative and qualitative data that due to heterogeneity are not easily amenable to clear cut analysis. However this was taken as challenge by researcher to familiarize with such research works.

Inescapability, to capture respondents at their place of work made it difficult to get their full attention/ cooperation.

5.3.2 Area for further research

Currently, contract farming approaches have been widely used by many agribusiness firms in developing countries. The approach has been suggested to be appropriate in bringing about increased income for farmers and positive multiplier effects for rural economy. However, in Tanzania the approach is not much practised especially by small-scale farmers. Therefore there are number of issues, which have not been covered thoroughly in this study, which can be covered by other researchers: These are:

- (i) Further study may be done to explore quantitatively the role / contribution of contract farming in the performance of farm activities.
- (ii) Similar studies should be conducted in other area to compare these results. This is because contract and other forms of vertical coordination differ substantially among commodities and across regions as well.

REFERENCES

- Ashimogo, G. (1994). Peasant Grain Storage and Marketing in Tanzania: A case Study of Maize in Sumbawanga District. A published PhD thesis at Humboldt University. Shriften Zur Internationale Agrarentwicklung Band 15, Verlag Köster, Berlin, German.366pp
- Azzam, A. (1996). Testing the monopsony inefficiency incentive for backward integration. *American Journal of Agricultural Economics* 78(3): 585-591
- Barney, P. J. and Ouchi, W.G. (1988). *Organization Economics*. Jossey-Bass, San Francisco. 165pp.
- Bhardan, P. K. (1989). The New Institutional Economics and Development Theory: A brief Critical Assessment. *World Development Journal* 17(9): 1389-7395.
- Boehlje, M. (2000). Critical Dimensions of Structural Change. Unpublished manuscript, Department of Agricultural Economics, Purdue University. 137pp.
- Boehlje, M. and Doering, O. (2000). Farm Policy in an Industrialized Agriculture. *Journal of Agribusiness* 18 (1): 53-60.
- Broken, R.F. (1990). *Dairy Marketing in Sub-sahara Africa*. Proceedings of a symposium, ILCA, Addis Ababa, Ethiopia, 26-30 November 1990, 105pp.
- Coase, R. H. (1937). The Nature of the firm. *Journal of Economics* 4: 386-405.

- Coase, R. H. (1988). "The Nature of the firm: Origin, Meaning, and Influence. *Journal of Law, Economic and Organization* 4 (1): 3-59
- Coulter, J. (1994). Cereal market liberalization in Sub-Saharan Africa: Lesson From Experience. *Food policy* 17(2): 420-430.
- Dalgado, C. (1999). Source of Growth in Smallholder Agriculture in Sub-Saharan Africa: The role of vertical integration of smallholder with processors and marketers of high value added items. *Agrekon* (special Issue) 38:165-189.
- Drabenstott, M. (1995). Agricultural Industrialization: Implications for Economic Development and Public Policy. *Journal of Agriculture and Applied Economics* 27 (1): 13-20
- Eaton, C. and Shepherd, A.W. (2001). *Contract Farming Partnerships for growth. A Guide*. FAO Agricultural Services Bulletin 145. Rome, FAO. 166pp
- Eicher, C.K. and Saatz, J. M. (1998). *Agricultural Transformation and Rural Economic Development*. International Agricultural Development. John Hopkins University Press, Baltimore. 87pp
- Eicher, C.K. (2003). "Flashback: Fifty Years of Donor Aid to African Agriculture." In: *Proceeding of the International Policy Conference "successes in African Agriculture: Building for the Future"*, sponsored by InWent, IFPRI, NEPAD and CTA, 1-3 December 2003, Pretoria, South Africa. 71-111pp.
- FAO (2001). *Contract Farming Partnerships for growth. A Guide*. Agricultural Service

Bulletin 145. Rome, FAO. [www.fao.org] site visited on 22/10/2005.

Food and Agriculture Organization (2004). *The State of Food insecurity in the World.*

Food and Agriculture Organization: Rome. 186pp

Fellows, P. and Axtell, B.L. (1995). *Quality assurance for small-scale rural food industries.* FAO, Rome. 120 pp.

Foss, P. (Eds.)(1995). *Economic approach to organization and institutions.* Dartmouth Sydney. 225pp

Glover, D. (1984). "Contract Farming and Smallholder Out grower Schemes in Less Developed Countries," *World Development Journal* 12: 11-12.

Glover, D. and Ghee, L.T. (1992). *Contract Farming in Southeast Asia: Three Country Studies.* Institute for Advanced Studies. University of Malaysia, Kuala Lumpur.162pp

Glover, D. and Kusterer, K. (1990). *Small Farmers, Big Business – Contract Farming and Rural Development,* Macmillan, London.170pp

Goodland, A. Coulter, J. Stringfellow, R and Tallontire, A. (1999). Contract farming and cooperatives in the provision of agricultural services in liberalizing economies in Sub-Saharan Africa. In: *proceedings of a workshop of the use of purchased inputs by communal farmers in Zimbabwe.* . (Edited by Gordon A and

Goodland A), 1-2 March 1999, Harare, Zimbabwe. Chatham, UK: Natural Resources Institute, pp. 19- 26.

Goodland, A. and Gordon, A. (1999). Credit provision for smallholder farmers: lessons from Uganda and Zimbabwe. In: *proceedings of a workshop of the use of purchased inputs by communal farmers in Zimbabwe. (Edited by Gordon A and Goodland A)*, 1-2 March 1999, Harare, Zimbabwe. Chatham, UK: Natural Resources Institute, pp 12 - 18.

Gujarati, D.N. (1988). *Basic Econometrics*. Edition McGraw-Hill, Inc. International Edition. 705pp

Henderrson, J.M. and Quants, R.E. (1988). *Microeconomic Theory: A Mathematical Approaches*. McGraw-Hill, New York. 420pp

International Fund for Agricultural Development (2001). Rural poverty report 2000/2001: Markets for the poor. [[hht:// www.ifad.org/media/Pack/rpr/5.htm](http://www.ifad.org/media/Pack/rpr/5.htm)] site visited on 10/10/2005.

IFPRI (2003). Sub- Saharan Africa: Agricultural Market reform and Beyond: IFPRI Sub-Saharan Africa synthesis summary of research findings. [www.ifpri.org] site visited on 8/10/ 2005.

- Joseph, M.A. (1984). Transaction Governance in Marketing Structures: A study in the Mild –Western, Hog marketing Channel. Dissertation for Award of MSc Degree at North University, Illinois, 122pp.
- Kandiwa, V. (1999). Economic Performance of smallholder farmers using alternative vertical coordination mechanisms for horticultural crops. Dissertation for Award of MSc Degree at Cornell University, 130pp
- Kashuliza, A.K. and Kydd, J.D. (1996). Determinant of Bank Credit Access for Smallholder Farmers in Tanzania. A Discriminant analysis Application. *Saving and Development*, (3): 285-304.
- Key, N and Runsten, D. (1999). Contract farming, small holders and rural development in Latin America: the organization of agroprocessing firm and the scale of outgrower production. *World development Journal* 27: (2) 381-401.
- Kherallah, M and Kirsten, J. (2001). The New Institutional Economics: Application for Agricultural Policy Research in Developing Countries. Working paper: 2001-7, 14pp.
- Kirsten, J and Sartorius, K. (2002). Linking agribusiness and small-scale farmers in developing countries: Is there a new role for contract farming? Working Paper:2002-13, 16pp.

Koenig, R.S. and Doye, D.G. (2002). Agricultural credit policy.

[<http://www.farmfoundation.org/2002.farm.bill/Koenig.pdf>] site visited on 16/10/ 2005.

Little, P. D. (1994). Contract Farming and Development Question. In: *Living under Contract*. (Edited by Little, P. D and Watts, M. J), University of Wisconsin Press, Madison. pp. 122-155.

Little, P. D. and Watts, M. J. (Eds)(1994). *Living under Contract: Contract Farming and Agrarian, Transformation in Sub-Saharan Africa*. University of Wisconsin Press, Madison. 190pp.

Maddala ,G.S. (1992). *Introduction to Econometric*. Prentice-Hall, Inc. A Simon and Schuster Company, Englewood Cliff, New Jersey. 323pp.

Minot, N.W. (1986). Contract farming and its effect on small farmers in less developed countries. MSU International Development Papers, working paper No.31. Department of Agricultural Economics, Michigan State University, East Lansing. 31pp

Minot, N. and Ngigi, M. (2004). Are Kenya's Horticultural Exports a Replicable Success Story? Evidence from Kenya background In: *Proceeding of the International Policy Conference "Success on Building African Agriculture: Building for the future"*, Paper no.12, 3 December 2004, Pretoria, South Africa. 1-4pp.

- Minten, B. and Kyle, S. (1995). *The impact of distance and road quality on food collection, market margins and traders' wages: Evidence from the Zaire former*. Cornell University. Ithaca. 118pp
- Ngailo, L. N. (1993). Economic analysis of the pyrethrum industry in Tanzania. The case of Njombe District. Dissertation for Award of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania, 177pp.
- North, D. (1990). *Institutions, Institutional changes and economic performance*. Cambridge university Press. Oxford. 124 pp.
- North, D. (1994). Constitutions and Commitment: Evolution of Institutions governing Public choice in 20th century England. *Journal of Economic History* 4: 803-841.
- North, D.C. (2000). A Revolution in Economics. In: *Institution, Contract and Organization: Perspective from New Institutional Economics*. (Edited by Mernad, C), Edward Helga, Cheltenham, UK. pp. 31-45
- Omamo, S.W. (2001). Transport costs and smallholder cropping choices: An application to Siaya District, Kenya. *American Journal of Agricultural Economics* 80: 116-123.
- Overboom, M. (2000). *Analysing governance structure of International supply chain: Chain Management in agribusiness and the food industry*. Proceeding of the fourth International Conference. Nairobi, Kenya, 13 November, 2000. 112pp

- Porter, G and Howard, P. K. (1997). Comparing Contract: An evaluation of contract farming scheme in Africa. *World Development Journal* 25: 227-38
- Posour, H. C. (1998). *The Potential Impact of Increased Vertical Integration on North Carolina grain farmers*. North Carolina State University. 137pp
- Poulton, N. C., Dorward, A., and Kydd, J. (1998). The Revival of Smallholder Cash Crops in Africa: Public and Private Roles in the Provision of Finance. *Journal of International Development* 10 (1): 456 - 465
- Reardon, T. and Barret, C.B. (2000). Agroindustrialization, globalization and International Development-An overview of issues, Patterns and Determinants. *Journal of Agricultural Economics* 23:195-205.
- Reardon, T., Cordon, J. M., Busch, I., Bingen, J and Harris, C. (2001). Global Change in Agrifood Grades and Standards: "Agribusiness Strategic Responses in Developing countries". In *International Food and Agribusiness Management Review* 12 (3): 22-39.
- Roy, E. P. (1963). *Contract Farming, USA*. The Interstate Printers & Publishers,inc. Danville, Illinois. 572pp
- Royer, J. S. (1995). Potential for Cooperative Involvement in Vertical Coordination and Value added activities. *Journal of Agribusiness* 11(3): 473 - 481.

Runsten, D and Key, N. (1996). Contract Farming in Developing Countries: Theoretical aspects and analysis of some Mexican Cases. Research Report no.3, August, 1996. Report prepared for the United Nations Economic Commission for Latin America and Caribbean , Santiago, Chile. 381pp.

Sadoulet, E and de Janvry. (1995). Structural Adjustments Under Transaction Costs. Proceedings of the 29th EAAE Seminar. Hohenheim, Germany. 101-126pp.

Sartorius, K., Kirsten, J and Masuku, M. (2002). A new institutional economics analysis of small farmer contracts and relation in sugar supply chains in South Africa and Swaziland. Pretoria, South Africa. 23pp.

Shechambo, F. (1993). The search for Transaction Mechanisms for Agricultural Production in Tanzania. The case of Lushoto District. A published PhD thesis at Humboldt University, Velarg Köster, Berlin, German. 212pp

Sofranko, A., Frerichs, R., Sammy, M., and Swanson, B. (2000). "Will farmers Organize: Structural Change and Loss of Control over Production".

[<http://web.aces.uuiuc.edu/value/research/organize.htm>] site visited on 22/10/2005.

Stigler, G. (1961). The Economic of Information. *Journal of Political Economy* 69: 213-225

Tacq, J. (Eds.) (1997). *Multivariate Analysis*. SAGE Publication, New York. 231pp

Temu, A.E. (1994). A study of Rural Financial Market in Tanzania. A published PhD thesis at Wye College, University of London, United Kingdom. 349pp.

Torero, M. and Gulati, A. (2002). Agricultural markets and rural poor. [<http://www.dfid-agriculture-consultation.nri.org/theme4/keypapers/povne>] site visited on 13/10/ 2005.

UN (2002). Agricultural subsidies, Market access, Support for small farmers. [<http://www.un.org/News/Press/doc/2002/envdev671.doc.htm>] site visited on 14/10/2005.

The United Republic of Tanzania (2005). *Agricultural Marketing Policy*. Ministry of Agriculture and Food Security, Dar-es-Salaam, 37pp

World Bank (1996). *Tanzania: The Challenge of Reform: Growth, Income and Welfare*. Report No.14982-TA. World Bank, Washington DC. 40pp

Weatherspoon, D. (2001). Linking Globalization, Economic growth and Poverty: Impacts of agribusiness strategies on Sub-Saharan Africa. *American Journal of Agricultural Economics* .83(3): 722 - 729.

White, J.T. (1999). *Market infrastructure Planning. A guide for decision maker*. FAO Agricultural Services Bulletin 141. Rome, FAO. 90pp

Williamson, O.E. (1985). *The Economic Institution of Capitalism*. The Free Press-Mcmillan, New York. 129pp

Williamson, O.E. (1993). "Transaction cost Economics and Organization Theory". Industrial and corporate change. *Journal of Economics* 2:107-156.

Williamson, O. E. (1996). *The Mechanism of Governance*. Oxford University Press, New York. 212pp

Williamson, O.E. (2000). Institutional Economist/Institution builder. In: *Institution, Contracts and Organization: Perspective from New Institution Economics*. (Edited by Mernad, C) Edward Helga, Cheltenham, UK. pp. 56 - 69.

APPENDICES

Appendix 1: Farmers questionnaire

Questionnaire No..... Date of Interview..... Interviewer's name.....

A: Household information

1. Name of household head.....
2. Village.....
3. District.....
4. Religion.....
5. Age of household head.....
6. Sex of household head: 1 = Male, 2 = Female
7. Marital status of household head:
 - 1 = Currently married, 2 = Never married, 3= widowed/ widower,
 - 4 = Divorced, 5 = Separated
8. How many years of schooling household head has completed.....
9. Household size.....
10. What are major source of income
 - 1 = Farming, 2 = Livestock, 3 = Salary, 4 = Others (Specify)
11. With your living income, your living standard is
 - 1 = Very good, 2 = Good, 3= Not good/bad,
 - 4 = Bad, 5 = Very bad

B: Sunflower production and marketing

12. For how long (years) have you been in agricultural activities.....
13. Size of the plot (in acres).....

14. Are you the owner of this plot:

1 = yes and farmed by household, 2 = yes but not farmed,

3 = yes, and sharecropped to another.

15. How much time does it take you to go from your dwelling to the farm?.....hours

16. Type of crops you usually grown

1... .., 2....., 3.....

17. Do you usually allocate land, equipment or inputs solely to market oriented production?

1 = Yes, 2 = No

18. Problem concerning the produce grown

1.

2.

3.

19. How many acres was planted with sunflower this season.....acres

20. How much sunflower was harvested during this season.....(kg)

21. What was the price of sunflower for this season.....Tshs/kg

22. What is the highest and lowest price you get for the sunflower this season (Tshs):

Maximum price Minimum price

23. How many acres was planted with other (name the crop) for this season.....acres

1. Crop 1 (name the crop)

2. Crop 2 (name the crop)

3. Crop 3 (name the crop)

24. How much other (name the crop) crop was harvested during this season.....(kg)

25. What is the price of other crops grown?

Crop name	Maximum price	Minimum price

26. Where do you mostly sell your produce?

1 = farm, 2 = local market, 3= wholesale, 4 = home.

27. Why do you prefer to sell your products in the place above?

1. Higher price.....
2. You can bargain with more buyers.....
3. You are sure you will be paid the agreed price.....
4. You have no other option (tied sales).....
5. Others (specify).....

28. (If q.26 not 1), how much time does it take you to go from your dwelling to the main sales market.....hours.

29. When do you mostly sell your crops:

- 1 = immediately after harvest
- 2 = you wait for higher price
- 3 = you already had a deal before you harvest
- 4 = when faced with the problem
- 5 = close to the begin of the new season
- 6 = others (specify)

30. If current sales price known of the produce:

1 = yes, 2 = no.

31. How in advance do you know the price in this market.....

(days, 0=same day).

32. Where do you get market price information?

1 = you go to the market

2 = friend/neighbor

3 = collector/gather

4 = radio

88 = others (specify).

33. How different is the effective sales price from the one you were expecting for the product?

1 = Higher than expected

2 = lower

3 = similar to the one you expected.

34. How many times do you sell your produce in a year (number of transactions).....

35. How long does the trader take to pay you back.....days (0 = The same day)

36. Have you had a problem with trader not paying for the product they have bought from you?

1 = yes, 2 = no

37. For how long have you know the trader that buy most of your production.....years [Years, 0 = current year]

38. Do you trust the trader/collector/firm buying most of your production?

10 = total trust, 1 = total distrust.

39. Have you ever received any of the following services from trader/collector/firm buying your product?

1. Transportation
 2. Monetary loan
 3. Loan of seeds/input
 4. Technical assistance
 88. Others (specify)
40. The trader pay:
- 1 = Cash, 2 = Credit
41. How much did you spent trying to follow up with the trader for produce sold.....Tshs
42. Are you using specialized inputs?
- 1 = Yes, 2 = No
43. If not used specialized input, why
1. High price
 2. Lack of technical skill in using them
 3. Poor extension services
 4. Unavailable
 5. Poor quality
 6. Expensive
 7. Others
44. If yes in question above, do you know the current price of your main input?
- 1 = Yes, 2 = No
45. How in advance do you know the price of your main input?
- (Number of days, 0 = same day)
46. Do you trust the trader selling most of your input?
- 10 = Total trust, 1 = Total distrust

47. Problem concerning the input used:

1.....

2.....

3.....

48. Do you have a written contract or informal agreement with the buyer/trader:

0 = No

1 = Yes, written contract

2 = Yes, informal agreement

49. (If q.48=no), would you like to produce under contract under terms other farmers in the area get:

1 = Yes, 2 = No

50. (If q.49= yes), then why never grow under contract

1. Don't know any buyer that offer contract

2. No contract in the crop grown

3. Buyers only contract larger farmers

7. Others (specify)

51. (If q.49=no), why wouldn't you like a contract or informal agreement

1. Don't trust contract buyers

2. Can earn more money without contracting

3. Cannot produce enough quality needed

7. Others (specify)

52. (If q. 48= yes), how do you consider this relationship?

1. Good 2. Bad

3. Has no effect 4. Don't know

53. (If q.52=Good), why was it good

1. Paid good price
2. Have guarantee price
3. You receive high quality input
4. You receive input in credit
5. You receive technical assistance in production
6. Others (specify)

54. (If q.52=bad), why was it bad?

1. They paid low price
2. You receive low quality input
3. Buyers broke the term of agreement
4. Others (specify)

55. How many years since you had an agreement with the buyer of your product.....years

56. How did your income changed when you started producing under contract compared to before:

1 = Large decrease, 2 = Small decrease,

3 = No change, 4= Small increase, 5 = Large increase

57. How did you get into contract or informal arrangement with trader?

- a. The buyer asked if we want to grow under contract
- b. Local officer asked if we wanted to grow under contract
- c. We asked or applied to buyer to grow under contract
- d. We asked or applied to local officer to grow under contract
- e. Others (specify).....

C: Agricultural support services

58. Which is your most important source of loan?

1. Commercial bank
2. Buyer of produce
3. Input salesman
4. SACCOS
5. Government
6. Family/friend
7. NGOs
8. Non of the above
88. Others (specify)

59. Did you apply to get a credit or loan to finance production in this year?

1=Yes, 2 = No

60. If you did not apply answer why?

1. You did not want it
2. Lack of endorsement or guarantee
3. Does not want to commit endorsement asked for
4. Risky to acquire debt
5. No service offered around
6. It is too expensive
7. 88. Others (specify)

61. Did you receive the credit or loan you applied for?

1 = Yes, 2 = No

62. Do you have access to extension services?

1 = Yes, 2 = No

63. Farmers have access to information?

1 = Yes, 2 = No

64. Household received technical farming assistance on the last 12 months

1 = Yes, 2 = No

THANK YOU.

Appendix 2: Contract farming models

Model	Description
Centralized model	This is a vertically coordinated model where the sponsor purchases the crop from farmers and processes or packages and markets the product. In Africa, these are often called “outgrower” schemes. Under these scheme organization and maintenance of a production chain is vital. Organizations that require stringent processing standards is essential, for crops such as tea, sugar and oil palm, with which farmers may have had little or no experience.
The nucleus estate model	The sponsor of the project also owns and manages an estate plantation, which is usually close to the processing plant. The estate is often fairly large in order to provide some guarantee of throughput for the plant, but on occasion it can be relatively small, primarily serving as a trial and demonstration farm. The British – based Commonwealth Development Corporation (CDC) was a pioneer of the nucleus estate model although now it no longer develops such estates. A common approach is for the sponsors to commence with a pilot estate then, after a trial period introduces to farmers (sometimes called “satellite” growers) the technology and management techniques of the particular crop. Nucleus estates have often been used in connection with resettlement or transmigration schemes, such as the case in East Africa for sugar cane and Indonesia and Papua New Guinea for oil palm and other crops.
The multipartite model	Usually involves statutory bodies and private companies jointly with farmers. Multipartite contract farming may have separate organizations responsible for specific function such as credit provision, production, management, processing and marketing. Multipartite structures are common in China where government departments as well as township committees and, at times, foreign companies have jointly entered into contracts with village committees and, since the early 1980s, with individual farmers.
The informal model	This model applies to individual entrepreneurs or small companies who normally make simple, informal production contracts with farmers on a seasonal basis, particularly for crops such as fresh vegetables, watermelons and tropical fruits. Crops usually require only a minimal amount of processing. Material inputs are often restricted to the provision of seeds and basic fertilizers, with technical advice limited to grading and quality control.
The intermediary model	Throughout Southeast Asia the formal subcontracting of crops to intermediaries is a common practice. In Thailand, for example, large food processing companies and fresh vegetable entrepreneurs purchase crops from individual “collectors” or from farmer committees, who have their own informal arrangements with farmers. In Indonesia this practice is common and is termed as “plasma”.

Appendix 3: Pooled within-groups correlation matrix

	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈
X ₁	1.00	-0.41	0.23	0.09	-0.77	0.91	0.20	-0.04
X ₂	-0.41	1.00	0.17	0.18	0.11	0.00	0.04	0.05
X ₃	0.23	-0.17	1.00	-0.04	-0.01	0.14	-0.01	-0.05
X ₄	0.09	0.18	-0.04	1.00	0.08	0.09	0.03	0.10
X ₅	-0.77	0.11	-0.01	0.08	1.00	0.10	0.05	0.02
X ₆	0.91	0.00	0.14	0.09	0.10	1.00	-0.05	0.04
X ₇	0.20	0.04	-0.01	0.03	0.05	-0.05	1.00	-0.07
X ₈	-0.04	0.05	-0.05	0.10	0.02	-0.35	-0.07	1.00

Note: All variables show a weak correlation i.e. $r < 0.5$.

Some variables seem to be weak and negatively correlated