ANALYSIS OF PERFORMANCE IN CHICKPEA VALUE CHAIN IN KAHAMA DISTRICT, SHINYANGA REGION, TANZANIA

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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ABSTRACT

The general objective of this study was to analyse the chickpea value chain performance in Kahama district in order to provide information to policy and decision makers to design effective programme for assisting farmers to benefit from chickpeas production. The specific objectives of the study were: (i) To analyse the structure of the chickpea value chain in Kahama district (ii) To measure performance at different stages in the chickpea value chain (iii) To determine factors influencing performance in chickpea production. Data for the study were collected from 119 respondents in selected villages in Kahama district including farmers, rural assemblers, wholesalers, retailers, and processors. Data were analysed using descriptive statistics, marketing margins, profit margins and regression analysis. Descriptive statistics were used to describe the characteristics of the value chain actors whilst prices, marketing and profit margins were used as indicators of performance at different stage along the chickpea value chain. Specifically, regression analysis was used to determine factors influencing chickpea performance at the farm level. Vertical and horizontal coordination along the chain was found to be weak. The flow of market information was limited to rural assemblers and was not transparent. Farmers had limited means of getting market information through rural assemblers those were not trustful in most cases. Prices and margins obtained by different actors along the chain varied significantly ($p<0.05$) with the wholesalers obtaining higher prices and profit margins despite the high costs they incurred. Results of the regression analysis indicated that education level, degree of specialization, land size and market access were major factors influencing chickpea profitability at farm level. Constraints like drought, diseases and pests out break found to affect chickpea production. The study recommends on improvement of chickpea productivity, formalization and strengthening of chickpea farmers' horizontal and vertical coordination.

DECLARATION

I, DENIS JAMHURI PIUS, do hereby declare to the Senate of Sokoine University of Agriculture that, this dissertation is my own original work, and that it has neither been submitted nor being concurrently submitted in any other Institution.

Signature..... Date 18.11.2011

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The above declaration is confirmed

Signature..... Date 21.11.2011

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(Supervisor)

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DEDICATION

This dissertation is dedicated to my beloved late parents Pius Mayige Samamba and Anastasia Wile Samamba who lit the torch of my academic career.

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LIST OF ABBREVIATIONS

BET	Board of External Trade
COLS	Corrected Ordinary Least Square
CRN	The Cancer Research Network
DAE	Data Envelopment Analysis
DALDO	District Agriculture and Livestock Development Officer
DASIP	District Agriculture Sector Investment Project
DFA	Distribute Free Approach
DW	Durbin Watson
ECAPAPA	Eastern and Central Africa Programme for Agricultural Policy Analysis
ESRF	Economic Social Research Foundation
FDH	Free Disposal Hull
GB	Great Britain
LZARDI	Lake Zone Agriculture Research and Development Institute
MAFC	Ministry of Food and Cooperatives
MALD	Ministry of Agriculture and Livestock Development
MLE	Maximum Likelihood Estimates
NMB	National Microfinance Bank
NSGRP	National Strategy for Growth and Reduction of Poverty
SACCOS	Saving and Credit Cooperative Societies
SFA	Stochastic Frontier Approach
SNAL	Sokoine Agriculture National Library
SSA	Sub Saharan Africa
SUA	Sokoine University of Agriculture
TASU	Tanzania Agriculture Scale Up
TE	Technical Efficiency

TFA	Thick Frontier Approach
Tshs	Tanzania shillings
UK	United Kingdom
URT	United Republic of Tanzania
VALEO	Village Agriculture and Livestock Extension Officer
VEO	Village Executive Officer

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Cultivation of chickpea in Tanzania started between late 1920s and early 1930s around the Lake zone, largely grown for domestic use. However, with trade liberalization in the early 1990s, and increasing export demand from India and the fall of cotton prices, have increased the importance of chickpeas which are increasingly being grown as a "cash crop (Tarimo and Van der Land, 2008). The main chickpea producing regions are Shinyanga, Mwanza, and Mara regions in the Lake Victoria zone. Other regions that produce chickpea include Arusha, Pwani and Morogoro (Tarimo and Van der Land, 2008). This study was conducted in Kahama district, Shinyanga region. Other major chickpea producing districts in Shinyanga region are Shinyanga Rural and Kishapu. Overall, Shinyanga region has evolved to be the main chickpea-buying centre of Tanzania owing to its potential production. In the area, chickpea production is a smallholder farm based with farmers cultivating approximately 10 acres of land using traditional methods. Chickpea is seen as a "bonus" crop as it is grown as a relay crop either after maize or rice harvest. It also increases food security in households, especially in that year of erratic rainfall in the major rain- season, when the major food crops, maize and paddy perform badly. Chickpea grows mostly in the low lands with vertisols (mbuga – black cotton clay soils) which provide the necessary residual moisture with which chickpea thrive on (Tarimo and Van der Land, 2008).

According to URT (2003), chickpea cultivation in Tanzania represents around 7% of the total pulses (beans, chickpea, cowpeas, bambara nuts, field peas, green gram, and pigeon peas) produced in the country. During that year (2002/03), around 29 885 tonnes of chickpea were produced from approximately 63 027 ha of cultivated land.

Like farmers in other crops, chickpea farmers in Tanzania are characterized by low productivity per unit of input and high risk. Yields and crop output are poor even in years of relatively good rainfall. The average productivity is 0.47 t/ha which is very low compared to world average which is 0.8 t/ha (Tarimo and Van der Land, 2008). As in other regions in the country, chickpea farmers in Kahama district are also faced with low producers' price, lack of appropriate (rural) storage facilities as well as asymmetric market information (Chiappori and Salani´e, 2000).

The current policy environment under the Agriculture Sector Development Programme (ASDP) attempts to promote production and marketing of high value agricultural products with a view to increase competitiveness in domestic, regional and international markets. The programme is being implemented through District Agriculture Sector Investment Project (DASIP) that is implemented in the lake zone regions, and the phasing out Participatory Agricultural Development and Empowerment Project (PADEP) that was implemented in most of the regions in the country. This was an effort to meet the markets for agricultural products which is changing rapidly with different market participants expanding rapidly in controlling the emerging market opportunities. In addition, markets are changing in response to changing consumption behaviour towards high value agricultural products induced by rising per capita income, migration, urbanization as well as globalization. Despite its potential, the sector is still not performing well; farmers are still lacking availability of production inputs and a low price of crops is still a constraint among farmers. Some rural areas are still impassable making marketing function difficult to execute. Factors affecting marketing of chickpea in the area is addressed by carrying out a value chain approach. Value chain involves all actors in the chain from the input suppliers, service providers, producers, institutional set up, as well as the final consumers (Kaplinksky and Moris, 2001). The issue of globalization increases the importance of

value chain since globalization patch up market gaps and brings producers and consumers closer together. It also brings regional and international competition into local markets (Kaplinksky and Moris, 2001).

1.2 Statement of the Problem and Justification

With its potential for exportation, chickpea is among the alternative crop for poverty reduction in places where it is grown. Chickpea is important in Tanzania for increasing the income of farmers since it does not compete for land with most other crops. Crops like maize and paddy are cultivated during the rainy season (November/December – February/March) whereas chickpea is grown in (March /April – July/August) after the harvest of maize and paddy. The remaining area is normally left fallow. Hence, there is a great potential to increase chickpea cultivation in Tanzania by replacing fallow. Farmers are increasingly growing chickpeas instead of leaving the land to fallow. However, Chickpea farmers in Kahama district like others farmers in Tanzania, are characterized by low productivity per unit of land, labour and capital. Yields of about 160kg/acre as opposed to 477.6kg/ha in India, Canada, Turkey and other chickpea producing countries have been reported (Tarimo and Van der Land, 2008). Previous research conducted by Oxfam GB (2008) in Kishapu and Shinyanga rural district, revealed that, the available high yielding variety have not reached farmers on large scale. Studies carried out by Amani (2004; 2005), Skarstein (2005) and Isinika *et al.* (2003) show that use of improved seeds, pesticide, and other inputs are very marginal, some of the chickpea farmers do not use fertilizer and insecticide at all. Increase in productivity might be attained through efficient use of the existing resources and addressing the socio-economic and institutional factors preventing it. In a poor country such as Tanzania where technology introduction and increasing inputs are possible, the identification of the extent of resource use in-

efficiencies in production of high value crops with export potential are crucial for relevant policy interventions.

Besides low productivity, farmers sell their produce at low price and hence low profit compared to other actors in the value chain (Tarimo and Van der Land, 2008). Farmers are ignorant of market prices, and other important market information as they receive all their market information from intermediaries or agents in their respective villages. Lack of institutional support for farmers also exacerbates the situation. In most cases the producers (smallholder farmers), are subjected to smallest share in comparison to other actors in the chain.

Despite its potential for increasing the income of rural poor, the crop has not been fully exploited. The local variety (desi) grown by farmers do not compete well in the international market. The marketed surplus is small and most of it is traded in the international market, but with the availability of the international market: farm-gate prices are still low. Small volumes, high transactions costs, lack of grading and quality control systems, characterize the market. As a result, Tanzania is a price-taker vulnerable to over-supply in international markets where the Tanzania crop has not developed full reputation.

Contrary to the past studies, where the focus was on production aspects, this study therefore, sought of analysing the structure of the chickpea value chain, measuring performance at different stage in the chickpea value chain and determining factors influencing chickpea profitability at farm level

1.3 Objectives of the Study

1.3.1 General objective

The general objective of the study was to assess performance along the chickpea value chain and determine factors influencing performance of chickpea production in Kahama district.

1.3.2 Specific objectives

i. To analyse the structure of the chickpea value chain in Kahama district
ii. To measure performance at different stages in the chickpea value chain
iii. To determine factors influencing performance in chickpea production

1.4 Research Questions

The study was guided by the following research questions:

i. What are the key characteristics of value chain actors?
ii. To what extent are the chickpea value chain actors organized and coordinated?
iii. What are the prices, costs, marketing margins and profit margins along the value chain?
iv. What are the key factors influencing performance in chickpea production?

1.5 Organization of the Dissertation

This dissertation is organized into five chapters including this introductory chapter which provides background information, problem statement and justification, objectives and research questions. Chapter Two presents the literature review, while description of the methodology employed in the study is given in Chapter Three. Chapter Four presents and discusses the results of the study. The conclusion and recommendations of the study are presented in Chapter Five.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Value Chain Concept

2.1.1 The concept of value chain

Different scholars have defined the value chain differently. Some authors have used the term value chain and supply chain interchangeably. Kaplinsky and Morris, (2001) described value chain as full range of activities which are required to bring a product or service from conception, through the different phases of production involving combination physical transformation and the input of various producer services, delivery to final customers, and final disposal after use. Roekel *et al.* (2002) defined supply chains like industrial arrangements that allow buyers who are separated by time and space to progressively add and accumulate values as products pass from one member of the chain to the next. The value chain concept has proven particularly useful for the identification and formulation of projects as well as in the development of strategies for improved agricultural and rural development (Kaplinksky and Moris, 2001; Kadigi *et al.*, 2007).

However, considering its general form, the value chain takes different strands joined together to form a chain. In the context of production, it bears the number of value added links of which there are ranges of activities within each link of the chain. Although often depicted as a vertical chain, intra-chain linkages are most often of a two-way nature. However, specialized design agencies not only influence the nature of the production process and marketing, but also are in turn influenced by the constraints in these downstream links in the chain (Kaplinksky and Moris, 2001). Kotler and Armstrong (2006) defined value chain concept as a study of a series of departments that carry out value creating activities to design, produce, market, deliver and support firm's products.

2.1.2 Value chain analysis approach and its use in Tanzania

2.1.2.1 Value chain approach

A value chain approach focuses on the interaction of actors along each step of the supply chain. Understanding of the value chains emanate from the filière approach (FIAS, 2007). This approach was developed by French researchers who studied vertical integration in agriculture. The French, who initiated studies in this arena prior to others, refer to "filieres" which can be translated as "channels" (Bertrand, Laurent and Laclerc 1984; Lauret 1983). It was soon applied to export commodity production of cotton, rubber, coffee, and cocoa in France's former African colonies. Most research was done by agricultural scientists interested in increasing the efficiency of these value chains by improving the functioning of public marketing institutions and reducing transaction costs involved in dealing with farmers. The filière-approach emphasized the measurement of input-output relations, prices and value added at different stages of the production chain which was relatively easy to do in fairly homogeneous commodities which were mainly regulated by State owned marketing boards.

A value chain approach offers a rationale and a practical approach for using value chain analysis as an empirical tool in identifying constraints to industry growth and competitiveness (FIAS, 2007). In order to increase value, the value chain needs to meet consumer demand. To meet consumer demand is not enough; the actors in the value chain need to meet consumer demand better than actors outside of the value chain: the value chain actors have to be competitive (Goletti, 2004). In order to keep competitiveness, the value chain needs to innovate continuously; otherwise their initial gains in competitiveness will be eroded over time. In order for the chain to establish effective linkages, the chain needs to distribute benefits that provide incentives to the participants. If only one party in the value chain appropriates all the benefit, the chain will not be

sustainable in a market system (Goletti, 2004). Value chain approach thus considers trade relations as being part of a series of networks of producers, processors, retailers, exporters, and service providers, whereby knowledge and relationships are developed to gain access to markets and suppliers (Golleti, 2005). Banana farmers often complain about receiving low prices while the other actors in the supply chains (traders, processors, retailers, transporters, storage facilities owners, etc.) appropriate most of the value paid by the consumer (Nkuba *et al.*, 2003). The causes behind the low prices received by farmers along the value chain include the relatively small quantities traded by individual farmers, poor access to market information by farmers, the risk of banana spoilage that is passed on to buyers, the inability of farmer to intervene further up the value chain and high transport costs to urban market. The degree of efficiency of transport systems is, therefore, a major determinant of market access, having a critical influence on farmer and consumer prices. Large gaps between farmer prices and consumer gaps often signal an inefficient marketing system with a multitude of intermediaries who add little value (Goletti, 2005).

2.1.2.2 Use of value chain approach in Tanzania

Value chain approach has gained popularity among researchers and practitioners in recent years. Several researchers have employed the approach to analyze different agricultural commodities. Mgaya (2008) on value chain analysis of rice marketing in Kilosa district, Morogoro region used the value chain approach to examine the organizational structures and interaction of rice traders along the value chain. Kabuje (2008) on analysis of the value chain for hides and skins in Dodoma and Arusha regions of Tanzania used the value chain approach to examine how the chain is organized, coordinated and functioning including linkages between the key actors in the value chain Kaplinsky and Morris (2001) stress that there is no "correct" way to conduct a value chain analysis; rather, the

approach taken fundamentally rests upon the research question that is being answered. Nevertheless, the aspects of value-chain analysis as applied to agriculture are particularly significant. Cosmas (2008) on assessment of the wholesale-consumer segment of the value chain for fresh fruits and vegetables in Dar es Salaam used the value chain approach to characterize fresh fruit vegetables marketing and distribution practices within the wholesale-retail segment of the value chain in Dar es Salaam region. For this study prices and margins were obtained in order to find who in the chickpea value chain is more efficient than the other so as to give information to farmers and decision makers in order to improve horizontal and vertical coordination.

Ng'atigwa (2008) employed the value chain approach in generating information to inform policies and describing strategies for adding value to the existing value chain for tomatoes in Mvomero District of Morogoro region. The study found out that tomatoes were delivered through farmers, assemblers, wholesalers and retailers to consumers. Paschal (2006) used the value chain approach in analyzing supply chain of green beans in Tanzania to identify the potential contribution of the small holder green beans sector toward economic sustainability of the Tanzania tea industry and rural livelihoods. In assessing performance of the green beans supply chain he used a set of performance criteria to compare different value chains Mshote (2006) analyzed spice marketing efficiency in Morogoro rural and Mvomero districts in Tanzania. She employed value chain approach to identify the market channels and role-played by various market participants. She employed value chain to determine economic profitability and pricing efficiency of spices marketing.

Enock (2008) analyzed the domestic markets in Tanzania and regional market in East Africa by employing value chain approach to identify the institutions involved in the

chain, constraints, opportunities and future developments to be made in the value chain of agriculture sub sector. Sheila (2008) used value chain approach to review the mining and trade laws along with cultural codes so as to establish to whether they facilitate small scale gold miners to become competitive. Kadigi *et al.* (2007) employed the value chain approach to determine the economic effects of food safety standards on livelihoods of actors in the Nile perch export value chain in Tanzania.

2.1.3 Value chain structure and coordination

The structure of a value chain includes all the firms in the chain and can be characterized in terms of five elements. These are end market opportunities, business and enabling environment, vertical linkages, horizontal linkages and supporting markets. The end markets are the starting point of the value chain analysis. End markets are people, not a location. These determine such characteristics as price, quality, quantity and timing of a successful product or service (Dunn *et al.*, 2006). End market buyers are a powerful voice and incentive for change. They are important sources of demand information, can transmit learning, and in some cases are willing to invest in firms further down the chain. End-market analysis assesses current and potential market opportunities through interviews with current and potential buyers, and takes into consideration trends, prospective competitors and other dynamic factors. Chains also operate in a business enabling environments that can be all at once global, national and local and includes norms and customs, laws, regulations, policies, international trade agreements and public infrastructure such as roads and electricity (ECAPAPA, 2006).

2.2 Performance Measures Employed in Empirical Studies

Performance is the most widely used concept in economics. It is measured by comparing the observed output against the feasible (frontier) output. The scarcity of resources is the

major factor that makes the improvement in efficiency so important to an economic agent or to a society (Farrell, 1957). In economics, terms such as performance, efficiency, productivity, technology growth, and economic growth are very widely used and sometimes interchangeably. However, although there are similarities and linkages among them, they are not equivalent. In supply chain management, marketing and profit margins are used as indicators of performance. In literature the performance measures have often been categorized into aspects of quality, time, flexibility, and cost. But most often cost is used as an only measure or cost and another measure for customer responsiveness is applied. Other more qualitative measures, like customer satisfaction or concerning risk management, are seldom used due to their restricted applicability in quantitative models. Performance indicators lie at the heart of a developing an effective performance management system they define the data to be collected to measure progress and enable actual results achieved to be compared with planned results over time. As a result, they are an indispensable management tool for making performance-based decisions about program, strategies and activities. Performance indicators have also been used to assist managers in focusing on the achievement of development results. Indicators may be quantitative or qualitative in nature.

By analyzing levels of marketing margins and their cost components, it is possible to evaluate the impact of the structure and conduct characteristics on market performance. It is generally acknowledged that a distribution system displaying acceptable performance is the one that allows technological progress , has ability to adopt, innovate and utilize resources efficiently and to transmit prices that reflect costs(OECD,1982) Common indicators of performance are trends in retail prices, level of stability of farm prices and income spread of marketing margins, marginal propensity to consume and farmers share of the consumers shilling spent on agricultural product, middlemen profit and parity farm

prices(Kohls and Uhl,1990) In this study cost measure in terms of marketing and profit margin is used to measure the performance of chickpea value chain.

The conceptualization and measurement of efficiency relies on the specification of a production function. The production function represents the maximum output attainable from the use of a given level of inputs. The production function describes production performance and productivity is the measure of it. Algebraically, productivity is defined as the ratio of the amount of output produced to the amount of resources used. However, efficiency is the ratio of the value of output produced to the cost of inputs used. By efficiency, here, we mean economic efficiency, which is a combination of technical and allocative efficiencies.

Technical efficiency is a component of economic efficiency and reflects the ability of a farmer to maximize output from a given level of inputs (*i.e.* output-orientation). One can trace back the beginning of theoretical developments in measuring (output-oriented) technical efficiency to the works of Debreu (1951 and 1959). Since then however there is a growing literature on the technical efficiency of smallholder farmers' agriculture. Notable works focusing on smallholders include Basnayake and Gunaratne (2002); Barnes (2008); Duvel *et al.* (2003); Shapiro and Muller (1977); and Seyoum *et al.* (1998). The average technical efficiency of smallholders reported in these studies range between 0.49 among maize farmers in Kenya to 0.76 among Tanzania sugarcane farmers. This shows smallholder farmers have low and highly variable levels of efficiency especially in developing countries.

Studies carried out by Amani (2004; 2005); Skarstein (2005); Isinika *et al.* (2003); MAFC (2006); Nyange and Wobst (2005), shows that smallholder maize productivity in the

country is suffering due to the fact that, most smallholders do not practice high yield farming methods, and produce only for subsistence. The same situation is happening in chickpea production. The development report on Poverty and Human Development of 2007(R and AWG, 2007) showed that 87 percent of Tanzania farmers interviewed by the research and analysis group under Tanzania's NSGRP said that they were not using chemical fertilizers. In another group 77 percent said they were, not using improved seeds; 72 percent said they were not using pesticide, herbicides or insecticides, due to high costs of agricultural inputs and services.

Although studies by Isinika *et al.* (2003) and Skartein (2005) among other had gone to the length to establish additional factors that are holding small holders from achieving their potentials, none of these studies have been able to address the high variation in productivity among smallholders. According to Ahamad *et al.* (2002) variations in productivity are due to management factors or in other words in efficiency gaps. Therefore, in order to accomplish sustained growth in agriculture, efficiency and productivity differentials have to be reduced. This can be achieved by having adequate knowledge and understanding of the sources of the smallholder farmers' productivity variations.

Various studies have examined the issues of productivity and technical efficiency of farmers. However, only a handful of them focus on Sub-Saharan Africa (SSA) and of these even fewer focus on Tanzania. Of the few studies that have analyzed efficiency in SSA agriculture include Duvel *et al.* (2003); Msuya and Ashimogo (2006); Shapiro and Muller (1977); Tchale and Sauer (2007); and Seyoum *et al.* (1998). In Tanzania, little empirical work has been undertaken to study quantitatively the efficiency levels of smallholder farmers with a purpose of identifying ways of improving their efficiency.

While Msuya and Ashimogo (2006) determined the technical efficiency of smallholder farmers, they focused on sugarcane production (a cash crop). Shapiro and Muller (1977) also focused on a cash crop (cotton). Little studies have determined the efficiency of smallholder farmers in Tanzania and focused on a food crop. Therefore, policy formulation has been hampered by this lack of relevant empirical studies at the farm level. The policy question therefore is: What is the current level of technical efficiency of smallholder chickpea farmers in Tanzania and what factors influence this current level of efficiency?

In analyzing the determinants of technical efficiency from stochastic production frontier functions, two approaches are involved. The first approach follows two-step procedure in which the frontier production function is first estimated to determine technical efficiency indicators while in the second step the indicators thus obtained are regressed against a set of explanatory variables, which are usually firms' specific characteristics (Greene, 1993; Parikh *et al.*, 1995 and Ogundele, 2003). The major drawback in this approach is the fact that it violates the assumption of the error term. This drawback led to the development of more consistent approach, which modelled inefficiency effects as an explicit function of certain factors specific to the firm. In this approach all the parameters are estimated in one step using maximum likelihood procedure (Kumbhakar *et al.*, 1991; Battese and Coelli, 1995; Seyoum *et al.*, 1998 and Ajibefun and Daramola, 2003).

The adoption of new technologies designed to enhance farm output and income has received particular attention as a means of accelerating economic development. However, output growth is not only achieved through technological innovation but also through the efficiency with which such technologies are used. The potential importance of efficiency as a means of fostering higher production has being recognized by many researchers.

Frontier efficiency has been used extensively in measuring the level of inefficiency/efficiency. Frontier functions can be classified into parametric and nonparametric linear programming approaches. The non-parametric approach is composed of the, (i) Data Envelopment Analysis (DEA) and (ii) the Free Disposal Hull (FDH). The parametric approach is composed of the, (i) Stochastic Frontier Approach (SFA), (ii) the Thick Frontier Approach (TFA) and (iii) the Distribution Free Approach (DFA). These methods differ mainly in the assumptions made about the functional form, whether or not random errors have been accounted for, and the probability distribution assumed for the inefficiency. Other important distinctions of the deterministic and stochastic frontiers are as follows: Deterministic models assume that any deviation from the frontier function is due to inefficiency so they are very sensitive to outliers. On the other hand, the stochastic approach allows for statistical noise (Thiam *et al.*, 2001). However, there is no consensus among researchers as to the best method for measuring efficiency.

Battese and Coelli (1995) proposed estimation of a frontier production model with technical inefficiency effects. They employed a model with time-varying technical efficiency, in which movements away from the production surface over time are represented by a linear trend. Among others, Cornwell *et al.* (1990), Kumbhakar (1990), and Lee and Schmidt (1993) have considered other possible time-varying technical efficiency models for panel data. The distinctive advantage of Battese and Coelli's model is that in addition to modeling the time-varying inefficiency, it allows estimation of the effect of farm-specific variables on inefficiency. The model avoids the inconsistency of a two-step approach to modeling the production frontier and inefficiency by modeling and estimating the frontier production function and the inefficiency effects model simultaneously. The ability to separate factors affecting the frontier from factors affecting

the inefficiency comes at a price of explicit assumptions about the distribution, of the error terms and inefficiencies.

In their article Bravo-Ureta, *et al.* (1993) suggested that the stochastic frontier production function could be established in two ways. First, if no explicit distribution for the efficiency component is made, and then the production frontier could be estimated using a stochastic version of Corrected Ordinary Least Squares (COLS). However, if an explicit distribution is assumed, such as exponential, half-normal or gamma distribution, then the frontier is estimated by Maximum Likelihood Estimates (MLE). According to Greene (1980), MLE makes use of the specific distribution of the disturbance term and this is more efficient than corrected ordinary least squares. Previously, Technical Efficiency (TE) was estimated using a two-stage process. The first step was to measure the level of efficiency/inefficiency using a normal production function. The second step was to determine socio-economic characteristics that determine levels of technical efficiency. This was done by using a probit model, with TE as the dependent variable and the socioeconomic characteristics as the independent variables. However, recently, the stochastic frontier and inefficiency models are jointly estimated using Limdep (Green, 2002) or frontier computing packages, which apply MLE. Green (2004) outlines the log likelihood estimation of the normal-truncated half-normal model.

Studies by Giannakas *et al.* (2000); have attempted and identify the sources of output growth in agriculture. By using the parametric production frontier approach, they attributed the technical change and to change in technical inefficiency. Technical change is associated with shift in production while changes in technical efficiency are related to movement towards or away from the production frontier. Implicit in this framework are assumptions of constant return to scale (Nishimizu and Page 1999; Fan *et al.*, 2000). The

scale effect can only be identified when input allocative efficiency is measured. In contrast, the effect of input allocative efficiency cannot be identified even if the assumption of constant returns to scale is maintained. Lovell (1993) concluded that within the parameter production frontier approach, production changes might at most be attributed to three sources; (i) changes in technical efficiency, (ii) technical change and (iii) the scale effect. However, under the assumption of the expected profit maximization, the production frontier approach has advantage of using single econometric equation estimation and of requiring only input and output quantity data. On the other hand, a distance function formulation can overcome the first of the aforementioned shortcomings of the production frontier, namely accommodation of multi-output and multi-input technologies. The terms referred to by Brummer *et al.* (2000) as output and input price effects could provide information about the existence of allocative efficiency, but their magnitude is irrelevant to the degree of allocative inefficiency as defined by Farrell and Kopp (1981), among others. In fact, these terms are by definition analogous to the price adjustment effect mentioned by Kumbhakar (2000).

More recently, models for inefficiency effects in the stochastic frontier production function have been proposed by Kumbhakar *et al.* (1991), Reifschneider and Stevenson (1991) and Huang and Liu (1991). Kumbhakar *et al.*(1991) cited by Battese and Coelli (1993) assume that technical efficiency effects are non-negative truncations of normal distribution with mean, which is linear function of exogenous factors whose coefficients are unknown and unknown variance. In addition, Kumbhakar *et al.* (1991) consider allocative inefficiencies associated with side conditions for profit maximization not being exactly satisfied. In application of their model to the US dairy farms, Kumbhakar, Ghosh and McGukin (1991) find that the technical inefficiency relate to the level of education of the farmers and the size of their farming operations. Technical and allocative

inefficiencies are investigated in the context of a stochastic frontier type that proves to be significantly different from the Cobb-Douglas production model.

Huang and Liu (1994) consider a stochastic frontier production function in which the no-negative technical inefficiency is linear functions of variables involving firms' characteristics. The additive random error of the inefficiency model is assumed to be truncation of a distribution with zero mode, whose point of truncation is dependent on the firms characteristics, such that the inefficiency effects are no-negative. Hence the random errors are not required to be non-negative, as the model of Reifschneider and Stevenson (1991). Huang and Liu (1994) apply their inefficiency frontier in the analysis of cross-sectional data from the electronic industry in Taiwan and assume that the explanatory variables in the efficiency model are the function of the firm specific variables and explanatory variables of the stochastic frontier. This makes their model a non-neutral shift of the traditional average response function, in that marginal products of the inputs and marginal rate of technical substitution depend on the firm-specific variables in the efficiency model.

Reifschneider and Stevenson (1991) proposes a model of inefficiency effects of the stochastic frontier production involving the sum of non-negative functions of relevant explanatory variables and non-negative random variable, which assumed to have half-normal, exponential or gamma distribution. This model is applied in the analysis of data on electricity generation in the US during the three different time periods. The hypothesis, that the inclusion of the inefficiency function does not change the estimates of the frontier function parameters, is rejected in the study.

The present study extends Kumbhakar *et al* (1991) model of the stochastic frontier function, using a linear regression model which assumes that technical efficiency effects are non-negative truncations of normal distribution with mean, which is linear function of exogenous factors whose coefficients are unknown and unknown variance non-normal, asymmetric disturbance term. A Meta analysis by Thiam, *et al.* (2001) on 32 frontier studies using farm level data from 15 different developing countries found that cross-sectional data exhibit significantly lower Technical Efficiency (TE) estimates than studies that use panel data. According to Green (1993), models relying on panel data are likely to yield more accurate efficiency estimates given that there are repeated observations on each unit. However, no prior expectations regarding the impact of data type (i.e. cross-sectional versus panel) on the magnitude of efficiency scores have been developed. In respect to this, a Cobb-Douglas stochastic frontier production function is assumed the most appropriate model for the analysis because of its ease in estimation.

2.2.1 Marketing margin

As it has been stated earlier in the previous section, marketing margin or price spread is a commonly used measure of the performance of a marketing system (Abbott and Makeham, 1990). It can be a useful descriptive statistics if used to show how the consumers' expenditure is divided among market participants at different levels of the marketing systems. It is defined as the difference between the price the consumers pays and the price that is obtained by producers, or as the price of a collection of marketing services, which is the outcome of the demand for supply of such services. A study by Timmer *et al.* (1983), defines, marketing margin in absolute and relative terms. Absolute marketing margin can be defined as the difference between the price paid by the consumers and that obtained by the producers based on absolute levels of prices. Marketing margins expressed in percentage terms are dependent on the relative levels of

prices. High marketing margin may imply high marketing costs and / or profits, if one or two, both are extremely high or low, it indicates that the market is not efficient in coordinating allocation of resources (Mdoe and Mnenwa, 2004). For an efficient market, marketing costs and profit ought not to be too low or too high, and so do marketing margins. According to Mendoza (1995), high marketing margin may some time result in little or no profit or even loss for the seller involved, depending on the marketing costs as well as the selling and buying prices. Marketing margin measures the share of final selling price that captured by a particular agent in the marketing chain. Tomek and Robinson (1981) defines marketing margin as the price difference between two market levels. They said marketing margin can be affected by number of factors such as distance to be covered, adequacy of transport, effectiveness with which various separate activities are carried out and services are provided.

A large number of studies have analyzed the marketing margins for different types of commodities to examine the performance of agricultural products marketing (e.g., Wohlengenant & Mullen, 1987; Schroeter & Azzam, 1991; Holt, 1993). Sexton *et al.* (2005) argued that even though variations in the margin over time might be attributable to marginal marketing costs under perfect competition additional factors such as seasonality, technological changes, and sales volume may explain the variations in the margin. In analyzing factors explaining variations in the margin, some authors used the observed margin as a dependent variable (e.g., Brorsen *et al.,* 1985; Wohlengenant & Mullen, 1987; Schroeter & Azzam, 1991). While others used the expected margin (e.g., Holt, 1993) as a dependent variable criticizing the former for not taking expectations with respect to both the mean and variance of the output price. The explanatory variables used to explain the variations in the margin may include marketing costs, total volume traded, time trend, seasonality and lagged margin.

2.2.2 Profit margin

As it has been stated earlier in section 2.2 that profit margin is the measure of performance. Profit margin is defined as the difference between revenue (Quantities times prices the customer pay) and the sum of all costs incurred with the production and delivery of the productive/service including fixed costs and variable costs. The profit margin is an accounting measure designed to gauge the financial health of a business or industry. The profit margin measures the amount of profit accruing to a firm from the sale of a product or service. It also provides an indication of efficiency in that it captures the amount of surplus generated per unit of the product or service sold. In order to generate a sizeable profit margin, a company must operate efficiently enough to recover not only the costs of the product or service sold, operating expenses, and the costs of debt, but also to provide compensation (Porter, 2001).

According to Porter (2001) margin spreads across the actors that is suppliers, producers, distributors, customers, along the value chain system depend on the structure of the value chain or system. Each member of the system will use its market position and negotiating power to get a higher proportion of this margin. According to Pomeroy and Trinidad (1995), analysis of profit margin or net returns aims to verify the existence of above average profits. If markets were perfectly competitive, net returns would roughly equal a fair return to ones capital. However, oligopolistic market structure would tend to increase returns as price distortion as well as bias buying and selling practices.

The term margin implies that organization realize a profit margin that depend on their ability to manage the linkages between all activities in the value chain. In other words, the organization is able to deliver a product/service for which the costumer is willing to pay more than the sum of the costs of all activities in the value chain (Porter, 2001).

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According to Scort (1995), returns are calculated based on estimated or actual costs and selling price per unit of sale and volume of product sold. Profit level from economic theory point of view indicates productive and allocative efficiencies of the business firms (Mutabazi, 2002). Although a business can have other objective apart from profit making for attaining economic viability and growth, any business must make a profit in long run. In perfect competitive market, actors behave such that the net profit received is not larger than is required to keep them in business. If profit is supernormal, other firms would be attracted into the industry and profit would be scaled down.

Moreover, the gross margin, marketing margin and profit margin have been used by several studies in Tanzania. Example Lazaro and Ashimogo (1989) in their study of marketing channel for horticultural products between Morogoro district and Dar es Salaam city for example show that market margins were the highest for the truckers who delivered the product to the city for the wholesale. Transport costs contribute about 37% to 40% of total cost along the channel. The profit margin ranged from 25% to 27% of the produce prices.

2.3 Factors Influencing Profitability

In this study variables included in factors influencing profitability of chickpea were the primary occupation of the household head, membership in an organization, means of accessing market information, education level, extension visit, household size, land size, farming experience and selling price. The measurement of performance remains an important area of research both in developing and developed countries. Performance goes a long way to determine the profitability of an enterprise and agricultural growth is linked to profit (Abdulai and Huffman, 2000). The relationships between profit as a measure of performance and the socio economic characteristics have not been well studied in

Tanzania. An understanding of these relationships could provide the policy makers with information to design programme that can contribute to measures needed for improving performance along the chickpea value chain. Most studies have associated farmers' age, farmers' education, access to extension, access to credit, agro-ecological zones, land holding size, number of plots owned, farmers' family size, gender, tenancy, market access, and farmers' access to improved technologies such as fertilizer, agrochemicals, tractors and improved seeds either through the market or through public policy interventions with technical efficiency. Farmers' age and education, access to extension, access to credit, family size, tenancy, and farmers' access to fertilizer, agrochemicals, tractors and improved seeds variables are reported by many studies as having a positive effect on technical efficiency (Amos, 2007; Ahmad *et al.*, 2002; Kibaara, 2005; Schultz, 1975; Tchale and Sauer, 2007; Lockheed *at al.*, 1980 and Basnayake and Gunaratne, 2002).

In farming activities, human physical energy is required. The level of active involvement by individuals in their farms to a large extent determines their production potential output levels. The farmers' age is an important factor in agriculture because it may affect the level of efficiency at the farm level (Nganga *et al.*, 2010). Influencing profit efficiency also is the farmer education level. This is because performance in agriculture production, that is, in terms of quality and quantity, speed of new technology adoption and rationalizing of input, may boost the output hence increasing the volume of sales as well as profit margin.

Nganga *et al.* (2010) in their study found that the age of farmer, experience measured in years and farm size has a significant effect on the profit inefficiency. A positive and significant coefficient of farm size and experience was also found and indicates that

farmers who have more experience and farm size tend to exhibit higher levels of profit efficiency. However, completely in line with a priori expectation, a positive and statistically significant relationship was found between age of the farmer and profit inefficiency.

Primary occupation was postulated to have positive impact since would tend farmers to devote more attention and resources to the chickpea sub-sector than other produces, thereby gathering information, making decisions, and adopting technologies that increase performance. Experience should enhance profit efficiency. A study by Wilson *et al.* (1998) and Rahman (2002) show that farmers who have more years in the enterprise achieved higher levels of efficiency. Access to extension services is a conduit for the diffusion of new technologies to the farmer by providing training; hence, it is expected to reduce inefficiency. Indeed, a number of studies (Ali and Byerlee, 1991; Seyoum *et al.*, 1998; Rahman, 2002, 2003) confirmed this.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Kahama district, Shinyanga region. The district was selected due to the following reasons: (i) It is one of the major chickpea growing areas in the country. (ii) It is one of the areas where new variety (Kabuli type) is beginning to be adopted by farmers. In addition to that, the district is one of the three pilot areas for chickpea production, selected for the Tanzania Agriculture Scale-Up (TASU) under OXFAM GB project. The OXFAM-GB project aims at piloting institutional innovations to enhance commercialization of smallholder agriculture production in selected regions of Tanzania.

Kahama district is one of the eight districts of Shinyanga region (Figure1). It is bordered to the west by the Bukombe district, to the south by the Tabora region, to the north by Mwanza region, and to the east by the Shinyanga rural and Shinyanga urban districts. The district has a total land area of about 8,477 Km^2 (847,695 ha). URT, (2002) reported the district to have a population of about 767,164 people with the growth rate of 3.3% of which 391,254 are female and 375,910 are male. However, only about 303,327 were in the age group that could contribute for farming and other production activities. Whilst about 280,633 people were in the dependency group that includes elders and children.

Figure 1: A map of Shinyanga region showing the study area (Kahama district)

Source: Kahama District Council planning department

3.2 Sampling

3.2.1 Selection of sample villages

Purposive sampling was used to select three chickpea producing wards out of 34 wards of Kahama district for the study. The reason for selection of these wards was due to its potential for chickpea production as they are endowed with good soil (mbuga) suitable for chickpeas production. From the four wards a sampling frame of all villages producing chickpea in the district was prepared. The list of villages producing chickpea were obtained from the District Agricultural and Livestock Development Officer (DALDO). From the sampling frame of 11 villages, a sample of 4 villages namely Bumbiti, Malito, Segese and Jomu was randomly selected (Table 1).

Table 1: Sampled villages by ward

Wards Selected	No of villages	Selected Villages
Isagehe	12	Bumbiti
Segese	11	Malito
		Segese
Chela	5	Jomu

3.2.2 Selection of sampled Markets

On the side of market selection, the number of traders trading chickpea was the criteria for selection. The number of traders was obtained from the Village Executive Officer office in each respective village, where they are obliged to report. Markets with more than 10 traders were selected for the study. Out of 8 markets, of Chela, Jomu, Segese, Malito, Bumbiti, Soko kuu mjini, Soko la Nyihogo and Soko la Wakulima, 7 markets were selected with the exceptional of Bumbiti market that has less than ten traders. (Table 2).

Table 2: Sampled markets by village /street

Ward	Name of markets	Selected markets
Segese	Segese	Segese
	Malito	Malito
Isagehe	Bumbiti	-
Chela	Jomu	Jomu
	Chela	Chela
Kahama mjini	Soko la Nyihogo	Soko la Nyihogo
	Soko la wakulima	Soko la wakulima
	Soko kuu kahama	Soko kuu mjini

3.2.3 Selection of sampled farmers

Sampling frames of all chickpea producing farmers were prepared from each selected village. The list of farmers was obtained in the Village Executive Officers (VEO) office of the respective selected villages. The list was prepared by Village Agriculture and Livestock Extension Officer (VALEO) in collaboration with the Village Executive

Officer (VEO). Table 3 shows the number of selected farmers in the sampled villages. As can be seen from the table, a total of 65 farmers were selected for the study.

Table 3: Distribution of Sampled farmers by village

Village	No of chickpea growers in the village	No of sampled farmers	Percent
Jomu	96	21	22
Bumbiti	87	18	21
Segese	46	10	22
Malito	79	16	20
Total	308	65	21

3.2.4. Selection of traders

Three categories of traders' namely rural assemblers, wholesalers and retailers in rural and urban areas were selected for the study. Table 4 shows the distribution of the sampled traders by market/location. In the table Kahama town is presenting a location and not a market. Selection of rural assemblers was facilitated by village executive officers in collaboration with the Ward/Village extension officers in the respective villages. This was possible because traders have to report to the village office before they start their activities. Rural assemblers were only selected from the villages and they only operate in rural areas while retailers were selected from both rural and urban areas. In rural areas, retailers were selected from lists of small shops selling chickpea. In urban areas, they were selected randomly by visiting them in the market place and selecting those who were selling chickpea as one of the traded commodity. A total of 31 retailers from both urban and rural areas were selected for the study (Table 4). The last category of traders was the wholesalers. Wholesalers were based in urban areas and they were fewer compared to the assemblers and retailers. A total of four wholesalers out of seven wholesalers of chickpea were randomly selected for the study. The list from which the sample was drawn was obtained from the DALDOs office.

Table 4: Distribution of Sampled traders by trader category and location

Location /Market	Traders category			Total
	Rural assemblers	Wholesalers	Retailers	
Jomu	3	0	6	9
Kahama town	0	4	0	4
Bumbiti	3	0	2	5
Segese	10	0	9	19
Malito	3	0	4	7
Chella	0	0	2	2
Soko kuu	0	0	3	3
Soko la wakulima	0	0	3	3
Soko la Nyihogo	0	0	2	2
Total	19	4	31	54

3.3 Data collection

Both primary and secondary data were collected for the study as described here under:

3.3.1 Primary data collection

Primary data were collected using a structured questionnaire designed to collect general and specific data from the sampled farmers and traders (Appendix 1). The questionnaire had sections for both farmers and traders. The questionnaire comprised a section on background information including household size, age, gender, education and occupation of the respondents, contracts, membership in an organization, marketing costs and challenges faced by the respondents. Specifically the section for farmers was designed to collect quantitative and qualitative data on chickpea production and management practices. On the other hand the sections for traders were designed to collect information on sources of chickpea and on the transaction cost i.e. buying and selling prices, processing and packaging. Apart from the structured questionnaire, physical observations and informal discussions with key informants were used to collect data to supplement the questionnaire survey. The information obtained from the questionnaire was then used in the quantitative and qualitative analysis.

3.3.2 Secondary data collection

Secondary data were obtained from various sources including, Board of External Trade, District Agriculture and Livestock Development Officer for Kahama district, Lake Zone Agriculture Research and Development Institute (LZARDI) at Ukirigulu in Mwanza, Sokoine National Agriculture Library (SNAL) and Ministry of Agriculture and Food Security and Cooperatives.

3.4 Data Analysis

To achieve each specific objective, both quantitative and qualitative analyses were carried out. The analysis included descriptive statistics (i.e. means, standard deviations, cross tabulation, ranges and frequency distribution to describe the general characteristics of the data). The quantitative analyses involved the use of gross margin, profit margin analysis, market margin and regression analysis. Gross margins and profit margins were computed to measure profitability along the chickpea value chain strands while the regression analysis was used to determine factors which influence performance in terms of profitability of chickpea at farm level.

3.4.1 Value chain mapping

Mapping was used to analyse the structure of chickpea value chain in Kahama district. To facilitate mapping of the value chain, an initial map was drawn using the data collected through key informants' discussion. The information obtained from key informants enabled to describe value chain map and relative functions of each actor. The map indicated that there were input suppliers, producers, rural assemblers, retailers, processors, wholesalers and at the extreme top of the map, the exporters. After detailed data collection, the map was adjusted. The value chain elements organized basing on the market level and their functions. Market level and actors presented as blocks, text were

inserted in each block indicating the function of actors. For the case where actors were involved in more than one function or market, the block was extended to reach the relevant market/function. Then, the blocks with text linked using strands between actors, with arrows in the direction of the product flow. The drawn map defined clearly market channels in a vertical manner culminating at each market at the top of map. The final map was able to answer the questions: what is being done in the value chain, how is the product / service reaching end market, who are the key players, and what are the market channels to reach the end market. Any basic value chain map must answer these questions.

3.4.2 Marketing margin analysis

Gross marketing margins were used to measure marketing performance of the chickpea produce at each node in the chain. The marketing margin was calculated by finding the price variations at different levels in the chain and then comparing them with the final price paid by the consumer using the following formula:

$$TGMM = \frac{CP - PP}{CP} X(100) \quad \text{..... (1)}$$

$$GMM_{i} = \frac{SP_{i} - SP_{i-1}}{CP} X(100) \quad \text{..... (2)}$$

Where:

TGMM = Total gross marketing margin in (%)

CP = Consumers price in Tanzania Shilling (Tshs)

PP = Producer price in Tanzania shilling (Tshs)

GMM^{i} = Gross marketing margin of i^{th} agent at agiven point in the value chain in (%)

SP^{i} = Selling price by i^{th} agent at a given point in the value chain in Tshs

SP^{i-1} = Selling price by a preceding agent (i-1), is the buying price paid by i^{th} agent at a preceding point in the value chain in Tshs.

3.4.3 Profit margin analysis

To achieve objective two profit margin analysis was used to establish economic profitability of chickpea along the chain. Profit margin analysis was used to indicate which actor has more influence in the value chain. It is assumed that, the more profits one gets the more influence one has in the chain. Therefore, the actor with highest profit margin along the chickpea value chain is the most efficient in chickpea business compared to other actors. Its main advantage is that it captures all the transaction cost incurred by the respective chain actors. Therefore at each stage of chickpea value chain, profit margin was obtained by subtracting the estimated total costs, fixed cost as well as variable costs of production/ processing/ marketing from the value of total output as shown in the following formula:

Principally,

$$PM^i = TR^i - TC^i \quad \text{.....(3)}$$

where by

PM^i = Profit margin at each value chain node

TR^i = Total revenue at each value chain node

TC^i = Total cost (Total variable costs + Total fixed cost) at each value chain node

i = value chain nodes along the chickpea value chain 1, 2, 3....

3.4.4 Regression analysis

A linear regression model was used to identify factors influencing performance at farm level where farmers' profit margin was taken as a function of other 9 variables which include degree of specialization, level of education, land size, farming experience, organization membership, extension visit, access to market information, household size and selling price.

The empirical model employed to analyze factor influencing performance in chickpea production was specified as follows:

$$\Pi = \alpha 0 + \sum_{i=1,j=1}^{9} \alpha_i X_j + \hat{\varepsilon} \quad \ldots\ldots (4)$$

Where:

Л = Profit margin of the farmer (in TSh)

$\alpha 0$ = The intercept of regression equation

α_i = Coefficient of parameter estimates (i=1 up to 9)

Xj = Parameter estimate (j =1 up to 9)

The empirical regression model was specified as follows:

$$\Pi = \sigma_o + \sigma_1 X_1 + \sigma_2 X_2 + \sigma_3 X_3 + \sigma_4 X_4 + \sigma_5 X_5 + \sigma_6 X_6 + \sigma_7 X_7 + \sigma_8 X_8 + \sigma_9 X_9 + \hat{\varepsilon} \quad \ldots\ldots (5)$$

Where:

Π = Profit Margin of the farmer (in Tshs)

σ_o = The intercept of the regression equation

σ_i = Coefficient of parameter estimate (i = 1-9)

X_1 = Education Level (in years)

X_2 = Degree of specialization (dummy, 1= farming; 0= otherwise)

X_3 = Land size (in acres)

X_4 = Farming experience (in years)

X_5 = Organization membership (dummy, 1= yes, 0= no)

X_6 = Extension visit (frequency of visit)

X_7 = Access to market information (dummy, by physical visit = 1; otherwise = 0)

X_8 = Selling price (in TSh)

X_9 = Household size (in numbers of members)

$\hat{\varepsilon}$ = Error term

All the variables in equation (5) above (education level of household head, access to extension services, farmer's experience in chickpea production, land size, organization membership, access to market information, selling price and degree of specialisation in chickpea production) were hypothesized to contribute positively to efficiency. Education was expected to improve the quality of labour. Studies conducted by Gizachew (2005) and Rehima (2006) showed that formal education, household market participation and marketed volume was positively related to efficiency. Therefore, in this study, formal education was hypothesized to affect chickpea profitability positively. Memberships to farmers' association / organization expected to pool together the little resource available, and make decision on effective utilization of resources. We assumed that, farmers who did not participate in farmers' groups were likely to obtain lower profit than their counterparts who were members of farmers groups. Access to extension services is a bridge for the dissemination of innovation to farmers; hence, extension was expected to reduce inefficiency in production and therefore increase profit level. Experience in years was also expected positively contribute to profit efficiency. A study by Wilson *et al.*

(1998) and Rahman (2002) showed that farmers with more years in the enterprise achieved higher levels of efficiency. Land size was expected to increase productivity leading to more profit in chickpea business. Selling price, if set higher than costs was expected to influence efficiency. On other the hand, degree of specialization was expected to have positive influence on efficiency. This is in line with classical economic theory, which recognizes specialisation as a key determinant of efficiency (Pastor, 2002).

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

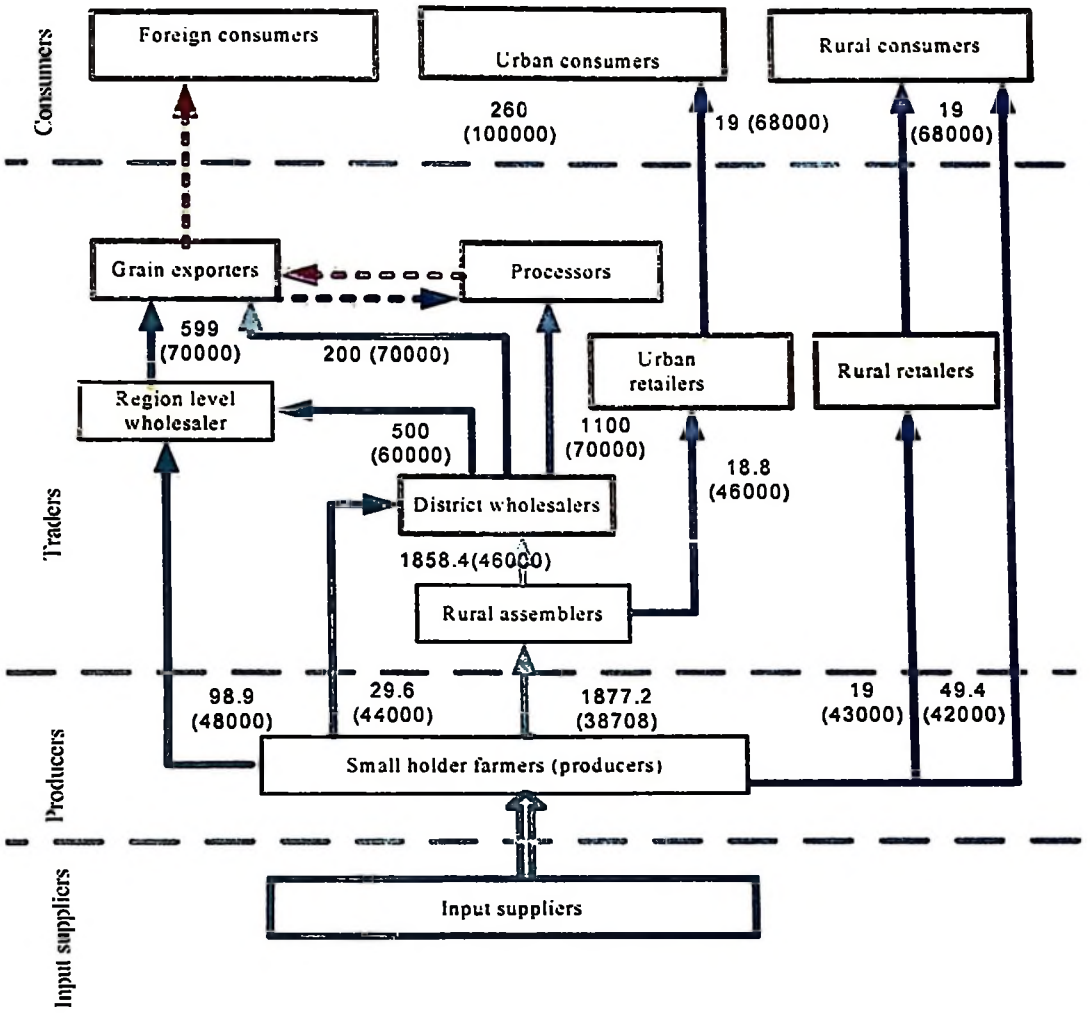
4.1 Structure of the Chickpea Value Chain

The chickpea value chain in the study area is complex, linking a number of actors as the grain moves from the producer to the consumers or end-user. The number of links in the value chain reflects the services that are required to deliver chickpea to the different consumers and end-users. Despite the length of the value chain, the structure of the chickpea markets shows limited transformation or value addition that takes place as the grain moves within a given marketing chain. The bulk of the chickpea grain is transacted in unprocessed form. This suggests that, beyond transport and limited storage, relatively few market services are provided by intermediaries, indicating a relatively unsophisticated market structure. While the overall structure of the value chain is quite complex, few major, value chain strands linking producers with different end-users have been identified.

Six main chickpea value chain strands were identified in the study area as depicted in Figure 1. The main value chain strands identified by the study were as follows: The first strand was that of producer selling chickpea directly to village consumers in the village. This strand was found to be the shortest of all chickpea strands identified during the field survey. Very small volume of the grain passed through this strand. The second strand was that through which chickpea pass from farmers to consumers via village retailers. Again, this chain strand handles only a small volume of the total marketed chickpea. Retailers collect the grain directly from farmers and sell it to rural consumers in village shops, making this channel to be the second short value chain strand. As it has been stated earlier, the amount of chickpea consumed in the rural areas is small. The rural consumers

include those engaged in non-agricultural activities and those farmers who do not grow chickpea.

The third value chain strand was that of producers selling to rural assemblers, rural assemblers to urban retailers, and urban retailers to urban consumers within the region. The fourth value chain strand is that of producers selling their chickpeas to rural assemblers; rural assemblers sell to district level wholesalers who sell to processors, processors sell to retailers and retailers sell to urban consumers. The fifth value chain strand involved producers selling directly to regional level wholesalers, then the regional level wholesaler sell to grain exporters who in turn sell to foreign consumers. The sixth was the longest value chain strand whereby producers sell their chickpea to small rural assemblers who also sell to region level wholesalers who transport the chickpea to Dar es Salaam and handle the chickpeas to processors; processors handle to exporters who finally sell to foreign consumers at market price.



Key

These nodes are in the chain but were not studied in this study

Channel exists but was not studied

Note: Values in parentheses are selling prices per bag (Tshs) and the values outside parentheses are bags (100kg each).

Figure 2: The value chains for chickpea grain in Kahama district

4.2 Characteristics of the chickpea value chain

4.2.1 Chickpea production

4.2.1.1 Scale of chickpea production and chickpea husbandry

Chickpea production in the study area is dominated by smallholder producers with the chickpea farm size ranging from a minimum of one acre to a maximum of 50 acres with an average of 8.1 acres per household. Land owned by farmers ranged from a minimum of 3 acres to a maximum of 150 acres, with the mean land size of 30.7 acres per household (Table 5). The remaining land was under other crops such as maize, cotton, paddy and sweet potatoes which ranged from a minimum of one acre to a maximum of 70 with a mean of 16.4 acres per household. Farmers had fallow land that was not used for agriculture purpose. Fallow land ranged from a minimum of one acre to a maximum of 30 acres with a mean of 6.2 acres per household.

Table 5: Average Land owned by sampled farmers

Variable	Minimum	Maximum	Mean	Std. Deviation
Size of land owned	3.00	150.0	30.7	29.5
Land for other crop	1.00	70.0	16.4	15.3
Land for chickpea	1.00	50.0	8.1	8.2
Fallow land	1.00	30.0	6.2	6.0
Land under chickpea as % of land owned	33%	33%	26.4%	

Chickpea cultivation is mainly done by the use of animal power, although some farmers with large chickpea farms hire tractor from district headquarter and business centres for land preparation. Most of the farm operations after land preparation including sowing and weeding are carried out by using hand operated tools with the exception of shelling

which is either carried out by tractor or oxcart and hand sticking. Table 6 presents different types of production equipments owned by sample producers. Table 5 shows that at least each producer had an average of 7 hand hoes, 1 oxen, 1 plough, 1 oxcart, 1 knapsack sprayer and a wheelbarrow. These are basic tools for traditional agricultural activities, typical indication of subsistence agricultural tools for cultivation. Among the sampled farmers, no one owned a power-tiller neither a tractor.

Table 6: Distribution of farm equipments owned by producers (n=65)

Item	Minimum	Maximum	Average
Hand hoes	2	25	7
Knapsack sprayer	1	2	1
Wheel barrow	1	1	1
Oxen plough	1	3	1
Oxcart	0	2	1

4.2.1.2 Amount of chickpea produced, sold and consumed at home

Table 7 shows chickpea production in the study area, the average bags produced per acre was 2.2 per year. This production per acre is low compared to that of other chickpea producing areas. In India which is one of the large producer of chickpea, production ranges from 600kg – 700kg per ha. This is equivalent to about 2.4 to 2.8 bags/acre (Tarimo and Van der Land, 2008). Table 6 shows that 81.8% of total production is sold; the remaining 18.2% is for home consumption and seeds for the next production season. This means that producers in the study area grow chickpea mainly for commercial purpose, and for food consumption in case of bad year. In the study area, the crop is treated as inferior food; this is supported by a small proportional of the produce that is consumed at household. Most of the produced chickpea is sold at farm gate, where rural assemblers collect the grain in the village (Table 7).

Table 7: Chickpea Produced, Sold and consumed in kilograms

Variable	Minimum	Maximum	Mean	Per cent	Std. Deviation
Chickpea production in (kg)	30.0	6000	1620		1250
Chickpea sold (kg)	20.0	5500	1430	81.8%	1180
Chickpea consumed(kg)	10.0	500	190	18.2%	170

4.2.1.3 Characteristics of the sampled chickpea producers

(i) Distribution of sampled producers by age

Table 8 shows the distribution of sampled producers by age. As can be seen from the table, the mean age of sampled producer was 42.9 years with a minimum and maximum age of 25 and 63 years of age respectively. The mean age of 42.9 falls within the range of active working group of 30 – 50 years of age, which can participate actively in the development of agricultural production, marketing, as well as processing.

Table 8: Distribution of sampled producers by age

Age group		Number	Percentage
Below 30 years of age		8	12.3
Between 30 – 40 years of age		23	35.4
Between 41-50 years of age		16	24.6
Above 50 years of age		18	27.7
Total		65	100
Mean Age	42.9		
Minimum	25.0		
Maximum	63.0		
Standard deviation	10.7		

(ii) Gender of sampled producers

Majority (93.8 %) of the respondents were males and only 6.2% were female (Table 9). The dominance of male household heads in the study area could be due to fact that in Tanzania, mostly males are traditionally the heads of households.

Table 9: Gender of sampled producers

Gender	Frequency	Percentage
Male	61	93.8
Female	4	6.2
Total	65	100.0

(iii) Education level of the sampled farmers

Table 10 shows the distribution of sampled farmers by education level. As can be seen from the table, most (60%) of the sampled household had primary education. Surprisingly, almost 37% of them had no formal education. This implies limited knowledge and skills in understanding and implementing extension messages disseminated to them.

Table 10: Distribution of sampled producers by education level

Education level	Number	Percentage
No formal education	24	36.9
Primary education	39	60.0
Secondary education	2	3.1
Total	65	100

(iv) Household size and age structure for sampled households

Table 11 shows household size and age structure of household members. The total average household size for sampled producers in Kahama district was 5.7 household members. This figure is close to that reported in the 2008 census for Kahama district, which was 5.6 persons per household. This implies that the sample drawn is a good representative of the population. Table 11 indicates that the average number of members in the sample producing households was about 4 people for age below 18 years, 3 people for age between 18 and 50 years. This is an indication of having enough active age labour force for agricultural activities in the study area.

Table 11: Household size and age structure for producers (n=65)

Structure	Minimum	Maximum	Mean	Std. deviation
Household size	2.0	14	5.89	1.65
Below 18	0.0	12	3.78	2.41
Between 18-50	1.0	9	2.43	1.87
Above 50	0.0	5	0.68	1.07

(v) Primary occupation of sampled farmers

The sampled farmers were asked about their primary occupations. All the respondents interviewed indicated their primary occupation to be farming including crop production and livestock keeping. In addition to chickpeas, the sampled farmers produced maize, cotton and paddy. Livestock kept included poultry, shoats and cattle.

4.2.2 Chickpea trading

Chickpea traders include rural assemblers, rural retailers, wholesalers, urban retailers, processors and exporters. The socio-economic characteristics of these traders are described in the subsequent sections below:

4.2.2.1 Socio-economic characteristics of wholesalers

A wholesaler either sell the produce to another wholesaler who in turn either sell it un - processed or sell it to the exporter in processed form. The four respondents interviewed during the survey were from trading companies dealing with buying and selling of agricultural produce including chickpeas. They were active young males with less than 45 years of age. Half of them had attained secondary education and the remaining half had post- secondary education. Their primary occupation was employment since they were employees of the trading companies.

4.2.2.2 Socio-economic characteristics of rural assemblers

Rural assemblers buy the produce at farm gate price and sell the produce to wholesalers who mostly have agents in the chickpea producing villages. The socio-economic characteristics of the sampled assemblers are described below.

(a) Distribution of rural assemblers by age

Table 12 shows the distribution of rural assemblers by age. The mean age of sampled rural assemblers was 39.3 years of age. As can be seen from Table 12, the sampled rural assemblers were young implying that they were energetic individuals capable of carrying out business, which require them to move around.

Table 12: Distribution of chickpea assemblers by age

Age group		Number	Percentage
Below 30 years of age		2	10.5
Between 30 – 40 years of age		9	47.4
Between 41-50 years of age		7	36.8
Above 50 years of age		1	5.3
Total		19	100
Mean Age	39.32		
Minimum	29.00		
Maximum	56.00		
Standard deviation	7.04		

(b) Distribution of rural assemblers by gender, education and primary occupation

Table 13 shows that most (94.7%) of the rural assemblers were males. Like in other forms of business in the study area and other parts of the country, participation of females is still low (5.3% in the study area) especially for the married females. On the other hand, almost all rural assemblers interviewed had formal education with the exception of one who had no formal education. More than half (52.6%) of the interviewed assemblers were involved in business as their primary occupation and the remaining part involved in farming as their primary occupation.

Table 13: Gender, education and primary occupation of rural assemblers

Item	Number	Percentage
Gender:		
Male	18	94.7
Female	1	5.3
Education:		
No formal	1	5.3
Primary	14	73.7
Secondary	4	21.1
Primary occupation:		
Farming	9	47.4
Business	10	52.6

4.2.2.3 Socio-economic characteristics of retailers

Rural retailers buy the produce from the farmer at farm get price. The volume of chickpea bought by rural retailers is the significantly small compared to that bought by other traders. The following sections describe the socio-economic characteristics of the sampled retailers.

(a) Age of urban retailers

Table 14 shows the distribution of the sampled chickpea retailers by age. The mean age of sampled urban retailers was 35 years with a maximum and a minimum age of 42 and 29 years respectively. This is an indication of having retailers who are young with adequate energy to perform retailing business.

Table 14: Distribution of chickpea urban retailers by age

Age group		Number	Percentage
Below 30 years of age		1	12.5
Between 30 – 40 years of age		6	75.0
Between 41-50 years of age		1	12.5
Above 50 years of age		-	0.0
Total			
Mean Age	35.38		
Minimum	29.00		
Maximum	42.00		
Standard deviation	4.44		

(b) Age of rural retailers

Table 15 shows the distribution of the sampled chickpea rural retailers by age. The mean age of sampled retailers was 36 years with a maximum and a minimum age of 51 and 21 years respectively. This is an indication of having retailers who are young with adequate energy to perform retailing business. As you can see in table 14 and table 15 the mean age of the two category retailers was almost the same.

Table 15: Distribution of chickpea rural retailers by age

Age group		Number	Percentage
Below 30 years of age		4	17.39
Between 30 – 40 years of age		12	52.17
Between 41-50 years of age		6	26.09
Above 50 years of age		1	4.35
Total		23	100.00
Mean Age	36.35		
Minimum	21.00		
Maximum	51.00		
Standard deviation	7.60		

(c) Distribution of urban retailers by gender, education and primary occupation

Table 16 shows that 75% of the sampled urban retailers attained secondary education, whereas 25% attained primary school. Genderwise the table shows that 75% of urban retailers were male. The same table shows that the primary occupation of all urban retailers (100%) was business.

Table 16: Distribution of Gender, education and primary occupation of urban retailers

Item	Number	Percentage
Gender:		
Male	6	75.0
Female	2	25.0
Education:		
No formal	0	0.0
Primary	2	25.0
Secondary	6	75.0
Primary occupation:		
Farming	0	0.0
Business	8	100.0
Employment	0	0.0

(d) Distribution of rural retailers by gender, education and primary occupation

Table 17 shows that 86.9% of rural retailers were males, this result is supported by the traditional believe that female's participation in business/ income generating activity in the study area and other places in the country is taken as failure of the husband to provide basic needs to his spouse. The same table shows that 78.3% of rural retailers had primary education and 4.4% had no formal education. As it can be seen in the table 47.8% and 43.3% had business and farming as their primary occupation respectively.

Table 17: Gender, education and primary occupation of rural retailers

Item	Number	Percentage
Gender:		
Male	20	86.96
Female	3	13.04
Education:		
No formal	1	4.35
Primary	18	78.26
Secondary	4	17.39
Primary occupation:		
Farming	10	43.35
Business	11	47.83
Employment	2	8.82

4.3 Coordination Along the Chickpea Value Chain

The following section describes the horizontal and vertical coordination along the chickpea value chain in the study area.

4.3.1 Horizontal coordination

Table 18 indicates that 49.2% of the sampled producers belonged to associations (farmer groups) while 6.2% and 3.1% belong to groups of political organizations and non-governmental organizations respectively. The groups were formed for maize and paddy production and not for chickpeas. The existing groups were under the system of farmers' field school, operated by District Agricultural Sector Investment Project (DASIP). Responses from farmers during interviews indicate that the benefits of cooperatives membership included easy marketing of produce, easy access to inputs, easy access to credit, increased bargaining power as well as cost reduction. Table 18 also indicates that 41.5% of the sampled producers had no associations; the major reasons gave were; no knowledge on dynamics of associations indicated by 61.5% of the respondent, no idea indicated by 35.4% respondents. None of the sampled wholesalers, retailers, and village assemblers belonged to any association. This is an indication of weak horizontal coordination across traders in the chickpea value chain.

Table 18: Producers membership and reason for non members

Type of organization	Number of farmers	Percentage
Farmer's group	32	49.20
Political organization	4	6.20
Non governmental organization	2	3.10
Total	38	58.50
Non members of any association	27	41.50
Total	65	100.00
Reasons for non members		
No knowledge on dynamic	40	61.50
No idea	23	35.40
Few producers	2	3.10
Total	65	100

4.3.2 Vertical coordination

Overall it was observed that there was weak vertical coordination among actors along the chickpea value chain. None of the sampled producer interviewed reported any form of mutual or contractual agreement with buyers of their chickpeas. However traders reported to have informal agreements among themselves. Table 19 shows proportion of actors in chickpea value chain with contractual agreement. The same table also shows that 69.2% and 50.0% of sampled rural assemblers and wholesalers had contractual agreement. Table 19 also indicates that 50%, 69.2% and 23.1% of the wholesalers, rural assemblers and farmers respectively sell chickpea to specific customers. This is an indication of existence of vertical coordination between wholesalers and rural assemblers. However, the coordination between wholesalers and rural assemblers exists because the former often uses wholesaler's money to buy chickpea in the villages. This takes place in the form of informal agreement based on mutual trust between rural assemblers and the wholesalers. This implies that there is an existence of vertical coordination between traders themselves than producers with traders in the chickpea value chain.

Table 19: Proportion of actors with contractual agreements

Actor		Number of actors with agreements	Percentage
Rural assemblers	(19)	9	69.2
Wholesalers	(n=4)	2	50.0
Retailers	(n=31)	4	12.9
Farmers	(n=65)	15	23.1

4.4 Prices and Marketing Margins Along the Chickpea Value Chain

4.4.1 Access to price information

Sources of price information for producers are relatively limited whereby all rural assemblers obtained price information after physical visit to market places. Whereas, 75 % and 74.3% of sampled wholesalers and retailers got price information by phone respectively. Those who used mobile phone to get price information said they had improved their business because they can easily get price information anywhere and at a short time. At the same time, wholesalers do use internet to make a follow up of the price in the world market. As there is no transparency, price change in the world market do not trickle down to farmers. Sometimes rural assemblers take this as an advantage by cheating farmers that, the price in the world market has decreased. They do so purposely in order to lower the buying price to increase their profit margin. Because the poor farmers do not have access to reliable market information, they do agree to sell their produce at throw-away price that cannot cover the production cost. Table 20 depicts the producers' sources of information. Producers' sources of information is very limited to rural assemblers whereby about 83.1% of the sampled producers obtained price information from rural assemblers while about 16.9% obtained price information from friends and relatives. About 9.2% and 4.6% of producers obtained information by physical visit to chickpea buying centres and by the use of telephone respectively. Those who use mobile phones indicated that mobile phones have helped them to save time that

was used for other activities, as they do not have to visit markets physically, although they claimed buyers to be dishonest in giving the market information.

Table 20: Price information for chickpea producers (%)

Item	Number of farmers	Percentage
Source of information		
Rural assemblers	54	83.1
Friend and relatives	11	16.9
Total	65	100.0
How information obtained		
Physical visit to market	6	9.2
Rural assemblers who come to buy	56	86.2
Use of mobile phones	3	4.6
Total	65	100.0

4.4.2 Prices and marketing margins

This section presents the prices and marketing margins received by the different actors along the six value chain strands.

4.4.2.1 Prices and marketing margins along Strand one

As indicated earlier value chain strand one (farmer-consumers), involves sale of chickpea directly to village consumers. The price received by the farmer who sold chickpea directly to village consumers varied from 44000 to 50000 with an average of 47000 Tshs per bag. In terms of share of consumers' price received by producer, the producer who sold directly to consumers received 100% of the price paid by consumers.

4.4.2.2 Marketing margin and Prices comparison along value chain Strand two

Table 21 compares the prices and proportion of final price paid by the consumers along the chickpea value chain strand two (Farmer – Village retailers– Consumers). The results

in the table show that, for every 44000 Tshs paid by consumers for a bag of chickpea a farmer gets 78%, while village retailers get 22% of the price paid by the consumer.

Table 21: Marketing margin and prices comparison for value chain strand two

Description	Farmer	Village retailers
Buying price	-	44000
Selling price	44000	56000
Marketing margin	44000	12000
Share of consumer price received by actors	78%	22%

4.4.2.3 Prices and marketing margins along Strand three

Table 22 compares the prices, marketing margins and share of final price paid by the consumer received by each actor along the chickpea value chain strand three (Farmer – Rural assemblers- Urban retailers – Consumers). Results in the table shows that for every 59500 Tshs paid by consumers of chickpea per bag; a farmer gets 13%, rural assemblers get 11% and urban retailers get 21% of final price paid by the consumers. This suggests that rural assemblers received the smallest proportion of final price along chickpea value chain in this strand.

Table 22: Marketing margin and prices comparison for value chain strand three

Description	Farmer	Rural assemblers	Urban retailers
Buying price	-	44000	50000
Selling price	44000	50000	59500
Marketing margin	44000	6000	9500
Share of consumer Price received by actors	13%	11%	21%

4.4.2.4 Prices and marketing margins along Strand four

Table 23 compares the prices and proportion of final price paid by the consumers along the chickpea value chain strand four (Farmer – Rural assemblers-Wholesaler – Processors – Retailers – Urban consumers). Results in the table show that for every Tshs 101500 paid by chickpea consumers per bag, farmers received 11% of consumers' price; Wholesalers received 15%, while processors received 17% and retailers received 23% of the final price paid by consumers. This shows that farmers received the smallest proportion of final price paid by consumers along the chickpea value chain.

Table 23: Marketing margin and prices comparison for value chain strand four

Description	Farmers	Wholesalers	Processors	Retailers
Buying price	-	52000	68000	78000
Selling price	52000	68000	78000	101500
Marketing margin	52000	16000	10000	23500
Share of consumer Price received by actors	11%	15%	17%	23%

4.4.2.5 Prices and marketing margins along Strand Five

Table 24 compares the prices and proportion of final price paid by the consumers that was received by other actors along the chickpea value chain strand five (Farmer – Rural Assemblers – Wholesale - Processors - Exporter – Foreign Consumers). Results in the table show that for every Tshs 82000 paid by consumers of chickpea per bag, a farmer gets 11%. Rural assemblers get 15% while wholesalers get 19% and processors get 17% of the price paid by the consumers. This shows that farmers received the smallest proportion of final price along the chickpea value chain compared to other actors.

Table 24: Marketing margin and prices comparison for value chain strand five

Description	Farmer	Rural assemblers	Wholesaler	Processors	Exporter
Buying price	-	44000	52000	68000	82000
Selling price	44000	52000	68000	82000	
Marketing margin	44000	8000	16000	14000	
Share of consumer price received by actors	11%	15%	19%	17%	

4.4.2.6 Prices and marketing margins along Strand six

Table 25 compares the prices, marketing margins and proportion of final price paid by the consumer received by each actor along the chickpea value chain strand six (Farmer – Small trader – Wholesaler – Retailers – Consumers). Results in the table show that for every Tshs 82000 paid by consumers of chickpea per bag, farmers get 11% of the price paid by consumer. Small traders get 32% of the price paid by consumers. Farmers get 14%, rural assemblers get 16%, wholesaler 15%, retailers 21% of the final price paid by the consumers. This result suggests that farmers received the smallest proportion of final price along the chickpea value chain compared to other actors.

Table 25: Marketing margin and prices comparison for value chain strand six

Description	Farmer	Rural assemblers	Wholesaler	Retailers
Buying price	-	44000	52000	64000
Selling price	44000	52000	64000	82000
Marketing margin	44000	8000	12000	18000
Share of consumer price received by actors	14%	16%	15%	21%

4.4.3 Summary of prices and marketing margin obtained by value chain actors

The results in Table 26 shows that gross marketing margin were highest (37.7%) for the wholesalers. On the other hand the higher gross marketing margin of wholesalers is due to the higher cost emanating from transport, grading, re-bagging, labour wage, taxes,

security and utilities. This is explained by the higher operation costs wholesalers incur in relation to other actors in the chain; the costs mainly include transport cost, cleaning, re-bagging as well as labour cost. In their study Ngambeki *et al.* (2008) obtained almost similar results when conducted a market study in Uganda to assess the extent to which the existence of many intermediaries in the market chain has distorted the distribution of profits, they indicated that farmers obtained only 20% of the price paid by consumer. Table 26 also shows that, rural assemblers had lowest gross marketing margin of about 10.9%. This small margin to rural assemblers is a result of low operation cost they incur. Rural assemblers handle large quantities of chickpea, but they have less cost since, they only incur transport cost from chickpea producing rural areas to chickpea buying centres, which are always located along the main road where big trucks can reach. The small transport cost distributed to the larger amount they handle lowers the marketing margin irrespective the amount they trade. The result also showed that, retailers had a gross marketing margin of 32%, and this shows that retailers got higher profits than the rest of the actors on the chain. Also the study by Malaisamy *et al.* (2008) on their study of supply chain management of banana in Tamil Nadu, India found the same results that little farmers share in consumer price happened when the number of intermediaries involved in the channel increased, because of higher total marketing cost.

Table 26: maximum, minimum, mean prices and marketing margins for chickpea

Actors	Maximum selling price/bag in Tsh)	Minimum selling price/bag in Tsh	Average selling price/bag in Tsh	TGMM (%)	GMM (%)
Producers	45000	30000	38709.68	43.5	18.8
Rural assemblers	48000	43000	46153.9		10.9
Wholesaler	82000	68000	72000		37.7
Retailers	70000	42000	68500		32.6

4.5 Profit Margins Analysis along the Chickpea Value Chain Strand Four

4.5.1 Profit margins obtained by producers

Table 27 shows that the average profit margin per acre of chickpea at farm level is estimated to be Tshs 7536.80. This profit margin is equivalent to Tshs 502.46 and Tshs 4567.80 profit margins per man-day and per bag respectively. Table 27 shows that producers have the lowest profit margin of all the actors in the chain. This profit margin is caused by relatively small quantity of output produced, which is the result of poor crop husbandry practices. In addition, poor access to market information and inadequate extension service results into selling their produce at lower farm gate price and hence low value product. High production cost incurred by chickpea producers cannot be covered over by the small quantities of chickpea produced hence the lowest profit margin.

Table 27: Profitability of smallholder farmers/producer

Description	Tshs
Area cultivated (acre)	898.50
Average annual yield per acre	2.20
Average Man-day per Acre	15.00
Annual production (bags)	1,976.70
Average selling farm gate price per bag	38,709.68
Average Annual Revenue	76,517,424.46
Variable cost	
Seeds	22,462,500.00
Herbicides	224,625.00
Weeding	13,477,500.00
Primary tillage	17,970,000.00
Secondary tillage	8,333,723.02
Planting	4,492,500.00
Spraying	269,550.00
Harvesting	898,500.00
Transportation	148,252.50
Storage	296,505.00
Total Variable Cost	68,573,655.52
Fixed Cost	
Plough	673,289.57
Hand hoe	468,664.57
Sprayer pump	30,000.00
Total Fixed Cost	1,171,954.14
Total Fixed Cost	69,745,609.66
Profit Margin per acre	7,536.80
Profit margin per man day	502.46
Profit margin per bag	4,567.80
Profit margin per kg	45.68

4.5.2 Profit margins obtained by rural assemblers

Table 28 shows that, rural assemblers got a profit margin of Tshs 6561.4 per bag. This value is more than that of the producer. Assemblers enjoy economies of scale and access to market information. The two parameters put the assemblers in a position of trading with certainty of making profit, since he/she knows the selling price prior to purchasing the produce. This condition allows assemblers to dictate the buying price to the farmers.

This is possible due to the vertical coordination that exists between assemblers and wholesalers.

Table 28: Profitability of chickpea at rural assembler level

Description	Tshs
Quantity of chickpea bought in bags	4 658.00
Average purchasing price per bag(Tshs)	38 709.68
Average selling price per bag(Tshs)	46153.90
TOTAL REVENUE(Tshs)	214 984 866.20
COSTS	
Cost of purchasing empty bags	1 397 400.00
Cost of twines	69 870.00
Cost of purchasing chickpea	180 309 689.44
Transport costs	1 014 605.74
Market levy	698 700.00
Storage costs	232 900.00
Security costs	698 700.00
Total Cost	184 421 865.18
Profit Margin	30 563 001.20
Profit Margin per bag	6 561.40
Profit margin per kg	65.61

In chickpea marketing, rural assemblers play an important role in collecting grain from smallholder producers at primary markets and deliver the grain to wholesalers at different levels. In most cases, these actors are independent operators who use their own financial resources and their local knowledge to bulk chickpea and other grains from the surrounding areas and transport the grains using oxcart and trucks for sale in secondary and tertiary markets. Sometimes, wholesalers give money to trusted assemblers on verbal agreement based on mutual trust to collect grain for them. Once the desired or available quantity of chickpea has been collected, the assemblers deliver the product to their buyers, who invariably arrange their own transport. The assemblers often receive cash advances to fund their activities. Gebremeskel *et al.* (1998) noted that although the assemblers typically operate independently, they may also act as agents for wholesalers on a fixed-fee or commission basis.

4.5.3 Profit margin obtained by wholesalers

Table 29 shows that average profit margin for wholesalers was found to be Tshs 17 265.8 per bag. This margin is about three folds that of producers. Wholesalers enjoy economies of scale, since they buy a large quantity of chickpea at minimum costs, and sell after a short time and thus increasing profit margin. In so doing the cost incurred at the wholesale level becomes smaller due to its distribution over large quantities of chickpea handled compared to other chain actors. The study found that, wholesalers dictate on prices because had access to market information. They used these opportunity as an advantage to exploit the other downstream actors in the chain.

Table 29: Profitability of chickpea at wholesale level

Description	Tshs
Quantity of chickpea bought in100kg bags	8 082.00
Average purchasing price per bag(Tshs)	46 153.90
Average selling price per bag(Tshs)	72 000.00
Total Revenue	581 904 000.00
Costs	
Cost of purchasing chickpea	373 015 819.80
Transport costs	28 287 000.00
Market levy	4 041 000.00
Storage costs	12 374 600.00
Security costs	4 800 000.00
Utility costs	1 800 000.00
Salaries	6 000 000.00
Government tax	10 503 250.80
Labour	1 540 000.00
Total Cost	442 361 670.60
Profit Margin	139 542 196.00
Profit Margin per bag	17 265.80
Profit margin per kg	172.66

4.5.4 Profit margins obtained by retailers

Table 30 shows an average profit margin of Tshs 13394.9 per bag at retailers' level. As it can be seen in the table, retailers have relatively higher profit margins compared to producers. This is explained by the facts that at retail level shelled chickpeas were sold direct to the consumers in village and urban (Kahama central market, Soko la wakulima Kahama, Soko la Nyihogo Kahama). The selling units at this market is normally vary from quarter a kilo and above. In addition, the retailers handled small quantities of chickpea due low demand of the produce especially in village shops where the grain is treated as an inferior good. However there is an increasing consumption of chickpea among the urban population mainly because of the growing recognition of its health benefits, change of eating habits as well as affordable source of proteins.

Table 30: Profitability of chickpea at retail level

Description	Tshs
Quantity of chickpea bought in bags	311.94
Average purchasing price per bag	49 207.00
Average selling price per 100kg bag	69 800.00
Total Revenue	21 773 412.00
Costs	
Cost of purchasing chickpea	15 349 631.58
Transport costs	155 970.00
Market levy	51 600.00
Processing costs	311 940.00
Storage costs	113 865.33
Security costs	217 000.00
Labour	1 395 000.00
Total Cost	17 595 006.91
Profit Margin	4 178 405.11
Profit Margin per 100kg Bag	13 394.90
Profit margin per kg	133.95

5.4.5 Summary of average profit margin obtained by value chain actors

Table 31 shows comparison of value chain actors on average profit margin per bag. As it can be seen in the table retailers have highest average profit per bag (26.3%). Retailers attain higher average profit due to value addition to the pulse by processing. The producers have the lowest average profit margin per bag (11.8%). The lowest profit margins earned by farmers found to be caused by relatively small quantity of output produced and poor access to price information

Table 31: Comparison of annual profit margins obtained by value chain actors

Value chain actors	Average revenues per bag	Average total costs per bag	Average profit margins per bag	Average profit margin per bag in (%)	Sig.
Producers (per bag)	38709.7 (5100.3)	34141.9 (10660.5)	4567.8 (14470)	11.8%	.000
Rural assemblers (per bag)	44333.2	37771.8	6561.4	14.8%	
Wholesaler (per bag)	82761.8 (6177.2)	65496.0 (7445.6)	17265.8 (2105.3)	20.9%	
Retailers (per bag)	62623.9 (3909.6)	49229.0 (1818.7)	13394.9 (4034.9)	26.3%	

Figures in parenthesis represent standard deviations.

4.5.6 Factors influencing performance at farm level

The factors influencing performance measured in terms of profitability of chickpea production in the study area were analysed using regression analysis as described in section 3.4.4 of chapter three. The results indicated that 66% of the variation in chickpea profitability generated at farm level was due to the independent variables included in the regression model. This means that, the specified predictors explained the dependent variable (profit margin) by 66%. All variables had theoretically appropriate signs except for experience that had negative correlation with profit margin, also there were no strong indication of auto-correlated disturbances as Durbin Watson test was around 2 as rule of thumb states. There were no multicollinearity between predictors as the VIF of each

predictor was less than 5 (Table 32). The table shows that, education level was significant ($p<0.01$) and positively correlated with profitability of the chickpea as hypothesized. Degree of specialization of the household head in chickpea production was also significant ($p<0.01$) and positively related with chickpea profitability. Table 29 also indicates that farm size had a significant ($p<0.01$) positive correlation with chickpea profit margin. This implies that farmers with large farms are liable to get larger profit margin than those with small farms. An increase in one unit of farm size leads to increase in profit margin by Tshs 71 417.55. Access to market information was also statistically significant ($p<0.01$) and positively related to chickpea profit margin. This finding is similar to what was expected.

The parameter estimates of each of these variables carried a sign that matched to the prior expectations except the experience in chickpea production. This was due to poor farming practices, that is to say no technological changes have taken place in the study area thus farmers continue planting local chickpea varieties. Bifarin *et al.* (2008) in their study of determinants of technical, allocative and economic efficiencies in plantain production industry in Nigeria found similar results; on the estimated coefficients of age where age was significant and has a positive signs for technical and economic inefficiencies; and extension service was negatively correlated with technical inefficiency. The results suggested that, if more resources were invested in extension services, there would be improvement in performance.

Table 32: Results of linear regression model

Predictor	Coefficient	β/Std Error	Expected sign	VIF	Sig.
(Constant)	-52957.48	6222.15			.000*
Education level	8838.69	1611.62	+ve	1.95	.006*
Degree of specialization	20504.04	15129.38	+ve	1.73	.000*
Land size	71417.55	14922.61	+ve	1.74	.000*
Farming Experience	-15247.06	5343.87	+ve	1.79	.151
Membership	10659.33	13021.29	+ve	2.04.	.563
Extension visits	27680.73	409.61	+ve	1.69	.581
Access to market information	15806.56	2223.64	+ve	2.54	.010*
Selling price	10075.65	4294.17	+ve	2.61	.174
Household size	7867.39	3660.48	+ve	1.76	.908

R^2=66%, Adjusted R^2 =61%, F=12*, DW=2.4, *=significant at (p<0.01

4.6 Constraints Faced by Actors along the Chickpea Value Chain

4.6.1 Constraints faced by chickpea producers

Table 33 shows the major constraints as pointed out by the sampled chickpea producers. About 33.8% of the sampled chickpea, producers' perceived insect pest attacking foliage and pods (*semiloopers*) and fungal diseases (wilting of the chickpea plant) to be the major factor constraining chickpea production. The disease affected the aerial, roots and stem parts causing the plant to die (*fusarium wilt*). The disease was reported in 2008/09 and 2009/10 seasons. About 18.5% of the sampled producers said lack of capital was the second major constraint. Other constraints perceived by the sampled producers were inadequate means of land preparation, drought, lack of capital, poor infrastructure and lack of access to financial services.

Table 33: Description of Constraints perceived by chickpea producers (n = 65)

Constraints	Frequency counts	Percentage of responses
Lack of capital	7	10.8
Low selling price	12	18.5
Lack of credit	2	3.1
Poor infrastructure	4	6.2
Pests and diseases	22	33.8
Drought	8	12.3
Lack of tilling implements	10	15.4
Total	65	100.0

4.6.2 Constraints facing rural assemblers

Table 34 shows constraints perceived by rural assemblers. The table shows that about 52.6% of the sampled rural assemblers reported un-reliable and inadequate supply of the pulse to be the major constraint. Both, lack of market information and poor infrastructure (15.8%) were the second major constraints in their business. Other constraints mentioned included supply of low quality chickpea grains and lack of access to credit facility which accounted for 10.5%and 5.3 % respectively.

Table 34: Constraints faced by rural assemblers

Constraints	Frequency counts	Percentage
Un reliable and deficiency supply	10	52.6
Lack of credit	1	5.3
Lack of marketing information	3	15.8
Supply of low quality chickpea	2	10.5
Poor infrastructure	3	15.8
Total	19	100.0

4.6.3 Constraints facing retailers

Table 35 shows constraints perceived by retailers. As can be seen from the table, about 48.4% of the sampled retailers mentioned low demand for chickpea as the major constraint followed by inadequate credit (25.8%). Other constraints that hinder retailers included low purchasing power and inadequate working capital. Low purchasing power and inadequate credit were said to be the result of difficulties in securing loans for small traders from financial institution in the country.

Table 35: Constraints faced by retailers

Constraints	Frequency counts	Percentage of responses
Lack of capital	3	9.7
Lack of credit	8	25.8
Liquidity problems	5	16.1
Low demand	15	48.4
Total	31	100.0

4.6.4. Access to financial services for wholesalers, retailers, village assemblers and farmers

Table 36 shows that 100%, 22.6%, 21.1% and 12.3% of the sampled wholesalers, retailers, village assemblers and farmers respectively had access to financial services. This implies that access to financial services increases as you ascend along the chain from producer to the consumers. As can be seen from the table, all sampled wholesalers had access to financial services from NMB and CRDB whereas their counterpart retailers had access to financial services from SACCOS, NMB and CRDB banks. The same table also shows that rural assemblers had access to financial service from informal financial and SACCOS in their respective villages. In general the table shows that there is inadequate financial service to support the chickpea value chain since most of the actors had no access to financial services neither through the informal nor the formal financial

institutions. Most of producers, rural assemblers and retailers in both rural and urban area had no security (collateral) that is a condition put forward by most commercial banks to secure a loan.

Table 36: Distribution of value chain actors on financial institutions

Value chain actors	Financial institutions					
	Informal	SACCOS	CRDB	NMB	Total	Percentage
Farmers (65)	6	2	-	-	8	12.3
Rural assembler (19)	2	2	-	-	4	21.1
Wholesaler (4)	-	-	1	3	4	100.0
Retailers (31)	-	3	1	3	7	22.6
Total	8	7	2	6	23	

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

The general objective of this study was to analyse the chickpea value chain efficiency in Kahama district in order to provide information that will help designing effective programme that will enable to link the actors in the chain and ultimately increase efficiency. The specific objectives of the study were: (i) to analyse the structure and characteristics of chickpea value chain in Kahama district. (ii) To measure performance at different stage in the chickpea value chain. (iii) To determine factors influencing performance in chickpea production. Data for the study were collected from farmers and traders in the study area. Both quantitative and qualitative techniques were employed to analyse the data. This chapter presents the conclusions and recommendation arising from the major findings of the study.

5.1 Conclusions

5.1.1 Characteristics of chickpea value chain

Generally, the value chain for chickpea in Kahama district was characterized by low value addition except for retailers and wholesaler who shelled limited amount of chickpea produce. Most of the chickpeas were traded in unprocessed form, value addition activities were limited to transportation, cleaning as well as re-bagging especially by wholesalers. Shelling was done in a very limited amount of the grain normally the one sold directly to consumers in urban and rural areas. No any other value addition activities like packaging, grading and bulking were done by producers. The quality of the chickpea was generally low as a result of poor handling methods. Sometimes it was possible to find the produce mixed with sand and gravel.

5.1.2 Prices and margins obtained by actors along the chickpea value chain

The findings of the study indicate that prices and margins obtained by the different actors in the chain varied significantly with the wholesalers obtaining significantly higher prices and profit margins at ($p<0.05$) despite the high costs they incurred.

5.1.3 Factors influencing performance at farm level

Based on the results of the linear regression model, it can be concluded that education level, primary occupation of household head, land area under cultivation, membership in an organization and physical means of accessing market information were the major factors influencing profitability of chickpea production in the study area.

5.1.4 Constraints limiting performance of chickpea at farm level

The study revealed drought, low chickpea prices, lack of market information, inadequate control of pest and diseases, inadequate capital, poor markets for chickpea and lack of extension services to be the major constraints in the chickpea value chain. Lack of inadequate land preparation implement is limiting expansion of area under cultivation; this is a critical problem, with inefficiency implements land preparation takes longer time as the result the soil dry up leaving no moisture for seed germination.

5.2 Recommendations

Based on the major findings of the study, the following are the recommendations geared towards improving performance of the chickpea value chain:

5.2.1 Improving chickpea production

Poor chickpea production practices such as planting only local varieties, inadequate of extension services were found to contribute to low productivity of chickpea from the study

area. To improve the situation, the study recommends improvement of extension services (with marketing knowledge), empowering chickpea producers by offering them with suitable agricultural implements and hybrid chickpea seeds that meets the taste and demand of consumers in order to commercialize chickpea production.

5.2.2 Establishment of farmers' group/association

The study findings show that most of the actors at various stages in the value chain were not organized. Horizontal and vertical coordination were found to be weak among actors in the study area. Farmers associations and/or groups should be formed in the study area to strengthen horizontal coordination. Deliberate initiatives should be taken to create awareness about the benefits of farmers association in the issue relating to markets of agricultural produce and specifically chickpea. The formed association should be imparted with the knowledge of agribusiness. This can be done by enriching the existing extension package with agribusiness knowledge. The Ministry of Agriculture Food Security and Cooperative should set a short term training course on agribusiness knowledge to all extension officers, in order to impart them with marketing knowledge. Training on leadership and management of farmers groups or associations should be coordinated, to avoid failure of the associations bearing in mind that past failure of most organizations or cooperatives was a result of poor management especially financial management. Training on leadership and management of groups/associations should be emphasized to avoid other failure. In addition, the advantage of collective bargaining could make associations able to purchase inputs in bulk and at discount prices and eventually sell them to producers at reasonable prices. The associations would increase bargaining power of producers and rural assemblers in setting prices.

5.2.3 Establishment of ware house receipt system

The study also revealed that there is a problem of storage facilities in the study area. The situation forces most of producers to sell their produce at harvest time when the prices are mostly low. We recommend establishment of ware-house receipt system in the area. This could be a best solution to terminate farmers' habit of selling their produce at the harvest time when the produce prices are always low *ceteris paribus.*

5.2.4 Improving the availability and accessibility of market information

Lack of market information was one of the factors affecting profitability of chickpea at farm level. Linear regression model analysis results indicate that profitability of chickpea at farm level was significantly and positively affected by physical means of accessing market information. Farmers lack information from outside their localities thus demand for information need to be created. In order to improve the situation, there is a need to establish market information network involving market search, prices and transaction costs so as to encourage different actors within the chickpea value chain to exploit fully the potential of information technology available in Kahama district such as cell phones, radio and magazines. Farmers can also be supported by getting current prices information from urban markets on their behalf by the agricultural marketing/extension officers.

5.2.5 Establishing and strengthening vertical coordination between actors along the value chain

The study discovered that there was a weak coordination between rural assemblers and wholesalers and between wholesalers and wholesaler/exporter along the chickpea value chain. Existence of informal contracts between them is the evidence of the situation. On the other hand there was weak coordination between farmers and the rest of actors in the chickpea value chain. To make the chain complete and of mutual benefit, the study

recommends formulation of policy that will enable agricultural produce chain actors to enter into a legal contract, at the beginning of chickpea production cycle, in order to protect producers.

5.2.6 Establishment of indicative price intervention

The study found that, the price received by farmers in the study area is low compared to other actors in the chickpea value chain. With this regard, the study recommends, the government intervene through setting of indicative prices based on production costs.

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APPENDICES

Appendix: 1 Farmers questionnaire

ANALYSIS OF EFFICIENCY AND DISTRIBUTION OF PROFITS IN CHICKPEA VALUE CHAIN IN KAHAMA DISTRICT, SHINYANGA REGION

SURVEY FORM

Questionnaire No:.....Date of Interview:.....
Name of Enumerator:.....
Respondent Name:.....
Region.....
District.....Ward.....Village.....

SECTION A: BASIC INFORMATION ON THE ACTOR'S FAMILY

A1. Status of household ... ...1= male headed, 2= female headed
A2. Age of respondent..... years
A3. Gender of respondent..... 1= male, 2= female
A4. Marital status..... 1= married, 2= single, 3= widow, 4= divorced
A5. Educational level of respondent ...1= No formal education, 2= primary education, 3= secondary education 4= Post secondary education
A6. What is your main occupation? (Circle the appropriate) 1= farming, 2= employed, 3= business, 4= others (specify)
A7. Household size and composition (number of people living together and sharing the same pot).....

Age group	Number (size of category)
Below 18 years	
18-50 years	
Above 50 years	

SECTION B: CHICKPEA PRODUCTION

B1. Do you own the entire land you are currently using for crop farming activities? 1=Yes ( ) 2 = No ( )
B2. If Yes, how was the land obtained? 1= bought ( ) 2= Inherited ( ) 3= Rented ( ) 4= Given by village government
B3. What is the total farm size of land used for crop farming activities by the household?.....
B4. What is the total size of the land (in acres) used for chickpea farming activities by the house hold.....
B5. What is the average chickpea production per acre.....
B6. For how long have you been in chickpea production? .....
B7. How much did you produce (chickpea) in last two seasons? Fill the table below.

year	Area under Chickpea production (Acres)	Production (bags/ha)	Amount sold (bags)	Price TZS/bag	When did you sell
2008					
2009					

B8. Has chickpea production (Yield) increased, remained the same or decreased during the last five years? .....
If decreased, give reasons.....
.....
.....

B9. Give the following details for chickpea inputs used and cost incurred in 2008/09

Input	Source	Quantity used	Unit price	Total cost
Seed				
Fertilizer				
Manure				
Herbicide				
Pesticide				
Hired labour				
Other (specify)				

B10.Please provide details on labour days used for various chickpea production activities during the last (2008/09) season.

Activity	Family labour(Man - days)	Hired labour
Cultivation		
Planting		
Weeding		
Fertilization		
Spraying		
Harvesting		
Transport from the field		
Storage		
Processing /Marketing		
Others (Specify)		

B11.Have you been visited by extension staff during the past five years? Yes...No.....
If Yes, how many times in a year?.....

B12. Has the availability of extension services increased, remained or decreased during the past five years?.....

B13.Where did you sell your chickpea last season (2008/09)?

Market outlet	June - September		October - November		December -January	
	Quantity	Price	Quantity	Price	Quantity	Price
Neighbours						
Trader at farm gate						
Local market						
Others (specify)						

B14. Do you normally sell chickpea shortly after harvest or store it and sell when prices are good?.....
.....
.....

B15. Do you grade chickpea for sale? Explain.....
.....
.....

B 16. Has access to chickpea market, increased, remained the same or decreased during the last Five years? .....
.....
.....

B17. State the major constraints/Bottleneck in chickpea production.
.....
.....
.....
.....

B18. Where do you get the marketing information?

a. from traders
b. from friends
c. Radio broadcasting
d. Magazines
e. Others (specify)

B19.How do you get this information?

a. by physical visit
b. by asking traders who come to buy
c. by listening to radios
d. by reading magazine
e. by the use of mobile phone
f. others (specify)

B20. Do you incur any cost to acquire marketing information? 1 =Yes / 2 =No. if Yes how much .....
.....

B21. Do you have contractual agreement with buyers? Yes.....No.....
If Yes what are the agreements?.....
.....
.....

Are they written or verbal agreements based on mutual trust?.....
.....
.....

B22.Do your household own the following?

Item	Number owned
Hand hoe	
Power tiller	
Tractor	
Ploughs (ox-drawn)	
Harrow	
Ox-cart	
Knapsack sprayer	
Wheel barrow	
Bicycle	
Motor bike	
Truck/car	
Radio	
Mobile phone	
TV set	
Others (specify)	

B23. Apart from chickpeas what were the other food and cash crops grown by the household. Fill the table below.

year	2008/09			
	Acreage	yield	amount sold	price
Cotton				
Paddy				
Chickpea				

SECTION C: PRODUCERS ASSOCIATION

C1. Is there any association for chickpea producers in this area? 1=Yes ( ) 2=No ( )

C2. If Yes is you a member? 1=Yes ( ) 2= No ( )

C3. Mention the name of association.....

Do you belong to any farmers organization	0 = No ☐			1 = Yes ☐		
If Yes, which type of organization	1	Farmers' Org		5	Women group	
	2	Political Org		6	NGO	
	3	Cooperative		7	Community based	
	4	Microfinance Org		8	other (specify)	

C4. What are the benefits of being a member? 1=Easy to market the produce ( ) 2= Easy to acquire inputs ( ) 3=Easy to acquire credit ( ) 4=Easy to negotiate for better price ( ) 5= (Others) specify

C5. If C2 above is No, what is preventing you from joining an association? 1= Few producers 2= No knowledge on dynamics of an association/group 3=No idea

C6. Have you received any advice on chickpea marketing? 1=Yes 2=No

C7. If Yes, by which organization?
(i).....
(ii).....
(iii).....
(iv).....

C6. What specific aspect of chickpea marketing do the organization explains?.....

C7. How frequently do you receive the advice? .....

C8. When did you receive advice on marketing last time?..... (Date/month/year)

C9. How did you find the advice? 1=Adequate ( ) 2= Not adequate ( )

C10. Did you purchase any input for farming activities? 1= Yes ( ) 2= No ( ). If Yes indicate the inputs, costs for the major crops.

Chickpeas:

Input	2008/09	
	Amount/ha	Unit price
Tractor		
H/hoe		
Fertilizers		
Herbcides		
Insectcides		
Others		
Total		

Cotton

Input	2008/09	
	Amount/ha	Unit price
Tractor		
H/hoe		
Fertilizers		
Herbicides		
Insecticides		
Others		
Total		

Paddy

Input	2008/09	
	Amount/ha	Unit price
Tractor		
H/hoe		
Fertilizers		
Herbicides		
Insecticides		
Others		
Total		

SECTION D: OFF-FARM ACTIVITIES

D1. Apart from crop farming activities, what other activities bring income into your household? And how much did you get in last season 2008/09?

Source of income	2008/09 (Tshs)
Formal employment	
Livestock keeping	
Mining	
Grocery	
Selling local brew	
Black smith	
Daladala (Bicycle)	
Carpentry	
Masonry	
Others (specify)	

SECTION E: CHICKPEA TRADING (WHOLE SELLERS, SMALL TRADERS AND RETAILERS)

E1. Indicate sources of chickpea, quantity bought and prices paid during the 2008/09 season

Source	Quantity procured	Unit price

E2. Have you been buying chickpea from the same sources during the last five years?
Yes.....No.....

If No what sources have changed and why?
.....
.....

E3. Do you have contractual agreement with your supplier? Yes.....No.....

If Yes what are the agreement?.....
.....

Are they written or verbal agreements based on mutual trust?.....
.....
.....

E4. Has availability of chickpea from your supplier increased, remained the same or decline during the last five years?.....

E5 Indicate outlets, quantities and prices received from your customers

Customer/market outlet	Quantity	Price received		
		June - September	October - November	December - January

E6. Has your customers demand for chickpea increased, remained the same or decreased during the last five years?

E7. Please provide details of costs you incur in your business in 2008/09

Cost item	Costs
Labour (loading and unloading)	
Transport	
Bags	
Premises (rent)	
Security	
Electricity	
Market charges	
Taxes (central government e.g. VAT)	
Business license	
Local government taxes	
Others (specify)	

E8. Are you happy with the taxes and levies you pay? Yes.....No.....
If No, which taxes and levies you are Not happy with and why?.....
.....
.....
E 9. What do you think should be done?.....
E10. What are the major constraints in your business?
.....

SECTION F: CHICKPEA EXPORTER

F1. Indicate sources of chickpea, quantity procured and price paid during 2008/09

Source	Quantity procured	Unit of measurement	Unit price

F2. Have you been buying chickpea from the same sources during the last five years?
Yes.....No.....

If No what sources have changed and why?
.....
.....

F3. Do you have contractual agreement with your chickpea suppliers?
Yes.....No.....
If yes, what are the contractual
agreements?.....
.....

F4 Are they written or verbal agreements based on mutual
trust?.....
.....

F5 Has availability of chickpea from your suppliers increased, remained the same or declined during the last five
years?.....
.....

F6 Indicate outlets, quantities and prices of chickpea received from your customers

Market outlet	Quantity(kg)	Price received(Tshs/unit)		
		June - September	October - November	December - January

F7. Is there adequate demand for the chickpea? Yes.....No.....
If No. give reasons.....
.....

F8. Has your customer demand for chickpea increased, remained the same or decreased in the last five years?

F9. Please provide details of costs you incurred in your business in 2008/09

Cost Item	Quantity (specify units)	Unit cost	Total cost
Premises			
Electricity			
Water bill			
Transport			
Labour (loading and unloading)			
Grading			
Bags and Packaging			
Storage			
Security			
Taxes (central Government)			
Business license			
Local government			
Sales personnel (wage)			
Others (specify)			

F10. Are you happy with the taxes and levies you pay? Yes.....No.....
If No, which taxes and levies you are Not happy with and why?.....
.....
.....

F11. What do you think should be done?.....
.....
.....
.....

F12. What are the major constraints/bottlenecks in your business?
.....
.....
.....
.....

F13. Do you receive complaints from your customers, on which aspects specifically?
.....
.....
.....
F14. How do you handle those complaints.....
.....
.....
.....

Thank you for your cooperation!