CHARACTERISTICS OF INTRA-RURAL SORGHUM MARKETING BY MALL HOLDER FARMERS [A CASE STUDY OF KAZUNGULA DISTRICT]

A Thesis

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LIST OF ACRONYMS

NGO	Non –Governmental Organization
FAO	Food and Agricultural Organization
SIDA	Swedish International Development Aid
FAOSTAT	Food and Agricultural Organization Statistical Data Base
FSRP	Food Security Research Project
BBS	Both Buyers and Sellers
NBS	Non Buyers and Sellers
ES	Exclusive Seller
EB	Exclusive Buyer
GTZ	Germany Technical Aid to Zambia.

ABSTRACT

CHARACTERISTICS OF INTRA-RURAL SORGHUM MARKETING BY SMALL HOLDER FARMERS: A CASE OF KAZUNGULA DISTRICT

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This report presents the results of a characterization study of intra-rural sorghum markets in Kazungula district of the southern province of Zambia. The impetus of the study came from the recognition that important changes have taken place in the staple markets since liberalization began in 1991 and as a result, a restructuring and organization of the grain markets. Whereas success has been achieved in commercializing maize grain marketing, limited trade occurs in the sorghum markets which have since remained undeveloped despite the numerous opportunities in the free and competitive marketing systems.

The overall objective of the study was to characterize the intra-rural sorghum markets. More specifically the characterization focused on the identification of the major participants in sorghum marketing, the nature of trade in the sorghum markets, the mechanisms involved in sorghum marketing, the constraints and the opportunities within the small holder marketing systems whose alleviation or exploitation could induce growth of the rural markets. To collect the necessary data, a survey was conducted on a random sample of 50 respondents from Kazungula district. Descriptive statistics were used to analyze the characteristics of the sorghum markets, its traders and the constraints faced in the rural marketing systems.

Results from the study showed small holder farmers are a heterogeneous group with respect to sorghum grain marketing. The small holder farmers can be assigned to four market participation categories including exclusive sellers, exclusive buyers, non market participants and both the buyers and sellers of the output. Education, age, gender, access to credit and assets owned by the principle trader are important factors that influence the nature of participation in sorghum marketing by the small holder farmers.

Further results from the study revealed that the sorghum markets are characterized as having low trade volumes averaging 250 kg for both sales and purchases. This is because the small holder farmers consume most of what is produced and very little output enters the market for trade. The trade channels that exist in these markets are restricted to the local grain processors i.e. the local beer brewers and the grain millers. The sorghum traders also have very small marketing margins because of the minimal value addition to the grain which is restricted to threshing and more so the produce is generally purchased at the farm gate and hence incurring minimal transportation expense.

The major constraint faced by the smallholder farmers in intra rural marketing is the limited markets that are available. The crop traders have limited access to the urban markets and much more so to the urban sorghum based food and beer industries. This has, to a larger extent contributed to the limited growth of the sorghum markets.
To address some of the problems that prevail in the sorghum markets it is recommended that the small holder farmers form farmers trading organizations in order to facilitate marketing with the urban industries and utilisers of the sorghum grain. Also efforts may be directed towards contract farming between the sorghum growers and the urban feed and beer industries for guaranteed markets for the sorghum farmers and consequentially growth of the sorghum markets.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The overriding aim of agricultural production and rural development in Zambia is the progressive improvement in production to achieve food security primarily through increased small farm yield, increased levels of income and much more importantly an improvement in the living standards of rural households.

Increasing production, however, is not the only way to achieve food security. The precarious nature of production and its uneven geographic distribution have focused attention on the need for an efficient distribution of what is produced. The marketing system can play an important role in encouraging production as well as distributing supplies. Therefore staple crop marketing is integral to small farm development and ultimately increased food production national wide (Jartzold and Schmidt, 1983).

Maize, following the post independence period to date has become the" cornerstone" of a social contract between the government, non governmental organizations and the Zambian majority in which both the controlled and free markets has centered attention on its marketing to redress the historical neglect of small holder agriculture and at the same time promoting increased small holder incomes and welfare. (Ray et.al 1998). Efforts from both the government and nongovernmental organizations have been towards its increased production through supportive policy frameworks, research and the provision of inputs at subsidized prices. The marketing of maize has also been integrated in the urban food systems and has received support from the government in the form of policy frameworks that support maize prices and marketing through the parastatal maize marketing body, the food reserve agency. These national policies which were accentuated following the liberalization process have further emphasized trade, flows, particularly maize grain from the rural to the urban areas

While this approach has achieved uneven success in promoting the small holder income and food security one drastic result of this agricultural marketing policy has been the dependence on maize sales by the smallholder farmers as the primary source of their livelihood. Staple marketing of other crops particularly sorghum and millet has received very little attention leading to its decline over the past few years, this has consequentially resulted in a decline in sorghum production by the small holder farmer and has discouraged the development of intra –rural markets and more so the marketing of other staple grains such as sorghum by the small scale farmers. Marketing channels between the producers and the major urban centers are poorly developed and are characterized by limited trade volumes due to scattered and irregular supply.

The formal sorghum and millet markets have been declining and are losing their importance in national staple marketing. Intra- rural sorghum markets have also not been very successful (Danida\Maldam, 1991). The localized sorghum markets have been declining despite the opportunities that exist for increased rural trade as a result of the increasing importance of sorghum in drought intermittent areas such as the southern province of Zambia as a food security crop, a fodder crop and its integration in both rural and urban food and non- food industries such as the beer industries.

In these areas where sorghum production has been encouraged by non-governmental organizations such as care international Zambia through its food security project and the input for asset program where the small -scale farmers receive inputs of which maize seed and sorghum seed form a part as alternative crops for production. However the marketing of sorghum has continued to decline over the years and the development of these markets has been limited, particularly after the liberalization process and before which the sorghum markets where highly developed as compared to maize grain marketing. As a result, maize has rapidly been replacing sorghum in the agro- ecological zones where sorghum ought to have an advantage and the resultant one way grain trading markets have further accentuated food deficits in the region and in Zambia as a whole. Therefore, though sorghum production is a growing activity in rural livelihoods, it is

unclear as to how much trade occurs in these areas and more so, on the organization of these markets as integral parts of the national marketing systems.

An analysis of the intra -rural sorghum markets is important in order to identify options for the distribution of market responsibilities further the factors affecting intra- rural sorghum trade must be understood in order to create better policy interventions and consequentially develop national sorghum markets as these form integral parts of national marketing systems and are the key to increased food security, small farm development and overall economic growth in the nation

1.2 Problem Statement

Sorghum marketing has seemingly remained more limited than expected particularly in rural food systems and markets where it should otherwise be increasing owing to its support in food security and in the livelihoods of the rural poor as an alternative to maize. With much policy emphasis on increased maize production and marketing in both the private and public sectors, the sorghum markets have been to a larger extent displaced by the maize markets even in areas where maize is agro-ecologically unsuited. This has to a larger extent lead to the reorganization of these markets and in most cases loss of the sorghum market with only marginal trade in some areas (Robarch, 2000). In areas where sorghum production is prevalent such as the southern province of Zambia, the organization of these markets is limited and little is known on the marketing participants, the marketing operations and much generally the characteristics of these markets relative to the maize markets.

Further the constraining factors to increased sorghum marketing and participation by the small-scale farmers in such regions remain unknown.

In this study the characteristics of intra-rural sorghum markets are investigated to provide a better understanding of the operations of these markets to guide policy formulation.

1.3 OBJECTIVES

1.3.1 General Objective

To identify the characteristics of intra-rural sorghum marketing

1.3.2 Specific Objectives

1. To identify the major participants in sorghum marketing
2. To identify the levels and nature of participation in sorghum marketing by the small- holder farmers
3. To determine the mechanisms involved in sorghum marketing
4. To identify nature and presence of rural sorghum processing
5. To identify the presence of institutions supporting sorghum marketing by the small- scale farmers
6. To determine the constraints to sorghum marketing

1.4 Significance of the Study

The development of national grain marketing and its promotion, as a stimulator of growth in production and income generation cannot be effectively done without a consideration and analysis of the ways in which the staple grain markets operate and function. Rural markets are affected in much the same way as urban markets if not more by policies and government intervention programs. if success is to be achieved in modernizing agriculture through increased productivity and commercialization it becomes vital to understand the characteristics of the intra rural markets and that of its traders for better and effective policy targeting also the constraints and the opportunities existing in the sorghum markets, whose exploitation or alleviation could lead to the growth of the sorghum markets should be identified as the starting point in the implementation of the agricultural commodity trading policies.

1.5 Limitations of the Study

Very few small holder farmers are engaged in sorghum production and the sorghum grain is not produced every agricultural production season. As a result it was very hard to find farmers who have been engaged in sorghum production for a minimum of three consecutive agricultural production seasons as was required in the research design. As a result the data that was collected was not very accurate as much of the collected information was recall data from the previous seasons in which the smallholder farmers had produced the sorghum grain.

For ease of carrying out the study the survey was restricted to the beneficiaries of care international Zambia who obtain inputs in the form of sorghum seed as an alternative to the maize seed. This created a bias as the non beneficiaries where left out and as such the sample was rather not representative.

In carrying out the survey there were some diesel shortages and so limiting access to some of the areas that would have been covered if that was not the case.

1.6 Organization of the Study

This report is organized into 5 chapters. The first chapter introduces the background of the study, the problem that justifies the undertakings of the study its significance and the limitations that were faced. The second chapter, literature review, undertakes the review of previous studies that are relevant to the understanding of the this study and gives insight as to some of the earlier finding on our subject of interest and guides the study into an in depth understanding and the generation of new and worthwhile information as this study aims to achieve.

The methods that were used with regards to the survey site, the sampling procedures that were used, the data collection tools and methods are laid out in chapter 3 of the report. Chapter 4 opens up to the findings of the study. It also discusses the findings and therefore gives meaning to data as collected.

Finally chapter 5 summarizes the conclusions as drawn form the study and offers recommendations based on the findings and suggestions of other studies that could be exploited to alleviate the identified problems

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section reviews earlier studies on intra-rural sorghum marketing that give insight into the characteristics of these markets the constraints faced as well as the opportunities that exist in these markets that could be exploited to lead to the growth of the national staple markets. This review of earlier studies from secondary data sources are relevant to this study in that they guide the study on the different methodological approaches that could be used and also on the direction that the study could take for the generation of worthwhile and new information. The literature reviewed is predominantly from the studies undertaken by SIDA, FAOSTAT and ICRISAT in there earlier studies on staple marketing with a focus on the operations of these markets, the nature of staple grain trade and highlight the staple features and constraints faced in these markets.

2.2 Importance of sorghum.

Sorghum and millet constitute a major source of energy and protein for 500 million people in Asia and Africa. (Hulse et al 1980) the average annual production of sorghum is estimated at 1.97 million tones in the sub- Saharan region alone.

The most important characteristic of sorghum is its ability to tolerate and survive under conditions of continuous or intermittent drought that result from decreased amounts of rainfall. (Hulse et al 1980). It is this factor that has made sorghum an important food crop in the rural food systems and its emergence as an important food security crop. However much as sorghum is seemingly an important food security crop in the rural systems and has potential for increased utilization, the development of national sorghum markets has remained limited and confined within the farming communities with very little trade beyond these areas. (FAO report 2000).

2.3 Sorghum Marketing in Zambia

In Zambia the rural sorghum markets are undeveloped as compared to countries like Botswana, Nigeria and Tanzania in which these markets are rapidly growing owing to increased processing and industrial utilization of the commodity. It has being tempting to conclude that sorghum marketing in Zambia has declined largely due to a bias in policy frameworks that support maize production and marketing relative to other grain types. This has resulted in a complete re-organization and structural change in the indigenous staple markets, particularly the sorghum markets. Without deliberate policies to stimulate growth in such markets small holder farmers have intensified efforts towards the marketing of staple crops such as maize which promise a ready market much to the expense of the sorghum grain. (FAOSTAT, 2002)

In a joint SIDA(1999) and ministry of agriculture study on intra –rural grain marketing in Zambia, the sorghum markets were characterized by having limited volumes of trade limiting the marketing activities in the region. In most parts of the country it was revealed that only limited exchanges in trade occur and these involved barter exchanges among the farming communities. Sorghum trade in most areas like, the Gweembe valley were characterized as being barter based with only a small proportion of the smallholder farmers participating in the trade. Only 26% of the farmers were buyers of the output, on a cash basis and these were the economically advantaged groups among the small holder farmers.

In the same study it was revealed that in other areas of the country such as the northern and southern regions, the sorghum markets were flourishing markets as the small holder farmers in this area preferred the sorghum grain to the maize grain. (Ray et al 2002).

An interesting feature of the sorghum markets as revealed by earlier studies, are the characteristic high prices of the produce compared to the urban areas, indicating a high premium price. The average price of the produce as documented in a GTZ (1982) collaborative study with the ministry of agriculture was K300 in the urban areas and

K600/20kg tin. These price variations were attributed to the failure of growth of the staple markets as no trade flows could profitably exist from the rural to the urban areas in which the major processing units exist.

In a study by DANIDA, (1991) in India the sorghum markets were characterized as the poor mans trade. This is because trading existed among the poorest farmers with little resource base and trade was in the form of exchange with other produce such as rice with the richer farming communities.

2.4 Staple Grain Traders

Intra rural staple markets are characterized as having relatively few grain traders as most of the small holder farmers consume most of what is produced in areas like the northern and Copperbelt province of Zambia were sorghum markets are relatively well established. However the grain traders still constitute a very small proportion relative to the highly predominant maize grain traders.

In a study on staple grain marketing in Zambia, it was found that 20 % of small holder farmers are engaged in sorghum marketing. 15.6% are sellers of the produce while 81.4 % of the small holder farmers consume all there produce.(Tembo et al, 2005).This further goes on to show the limited trade existing in the sorghum marketing.

In another study by International Food Policy Research Institute, (IFPRI, 2002) it was revealed that decisions to participate in staple grain marketing and marketing a particular crop such as sorghum is determined by a number of household characteristics such as the economic leverage of the households influenced by, the landholding, assets held, levels of off farm and on farm income. The socio demographic characteristics of the household head such as the age, gender, marital status and the level of education of the household head who undertakes the marketing of the produce and management of the respective farms is also vital to the crop marketing decisions. These socio-economic factors are therefore critical in understanding the characteristics of the market participants in the intra rural sorghum markets.

2.5 Processing Units and Infrastructure in the Rural Markets

In an ICRISAT (2002) collaborative survey on sorghum marketing and production in India, a lack of processing units in the localized markets was highlighted as a predominant feature of the rural markets. Most of the village level processing included beer brewing with a little milling in some areas. A large quantity of produce is also sold informally in these areas as the major channel of trade with a very small quantity of the produce being sold through the co-operatives.

In another study by SIDA (1982), the intra-rural grain markets were characterized as having limited infrastructure particularly storage for the produce. This hampered increased marketing in these areas in which output was high. Further a lack of transportation facilities was highlighted as a major constraint to sorghum marketing as most of the sorghum growers were scattered throughout the region and were located in outlying regions making trade difficult. Though much trade occurs informally most of these markets are generally limited and trade occurs mostly within the surrounding regions and the farming communities.

2.6 Conceptual Framework

The theory of marketing tells us that perfectly competitive markets are desirable because they lead to economic efficiency. The characteristics of rural marketing derive from the classic characteristics of economic markets. Rural markets are generally characterized by having a small number of buyers and sellers. In particular they involve more than single communities encompassing surrounding areas in the farming communities.

Marketing is characterized by a continuum of variables if it is to occur efficiently. There should be a presence of effective marketing channels that efficiently distribute produce from the surplus regions to deficit areas. This should be coupled by the presence of infrastructure to facilitate this distributive system. Infrastructure in this case should include storage and transport facilities to move the produce from the surplus to the deficit

regions though this may not be a very important factor in intra-rural trade as trade most often occurs within the farming regions

Another important aspect of rural marketing is the presence of rural processing and milling of the grain for value addition in order to stimulate production and much more importantly increase sales as a result of increased value that can be added to the product. Finally in rural marketing the presence of supporting institutions is also important if trade is to occur more smoothly and profitably in the region. These institutions include co-operatives and other organizations such as the non-governmental organizations that offer support to the small-scale farmers in terms of entrepreneur skills or actual marketing of the produce.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter outlines the study design, background information of the study area and its people from which the sample of respondents were selected. The sampling procedures that were used are further outlined in this chapter along with the types of data that was collected with the intent to capture the essence of intra-rural sorghum marketing. In the analysis of the collected data descriptive statistics were used. Analyses of variance mean comparisons, chi-square tests and cross tabulations were used as the statistical tools for the analysis.

3.2 Study Site Background

The study was carried out in Kazungula district in the southern province of Zambia. Kazungula districts is a drought intermittent area and lies in Zambia's agro-ecological region one. This region receives rainfall less than 600mm and the soils are acidic hence making maize production unsuitable for the area. The farmers in this district as engaged in agricultural production as there major main stay. A majority of the small holder farmers are primarily engaged in subsistence agriculture and a relatively small populous are engaged in the production of the cash crop, cotton. The district has on average 1500 smallholder farmers.Kazungula district was selected because of the following reasons.

- The small- scale farmers in this area grow sorghum as an emergency crop in case of maize failure, as an alternative, and are thus engaged in some form sorghum grain trade, creating a conducive study site for intra-rural sorghum exchanges and trade.
- Care international Zambia through the input for asset project and the food security project has for some time being distributing sorghum seed to the small holder

farmers , in such areas were inputs are provided, productivity is enhanced and hence inducing exchanges and trade of the surplus produce. This further justifies the selection of the district for the study.

3.3 Data Collection Procedure

Based on the nature of a social survey, a structured questionnaire was developed as the principle data collection tool for the primary data to be used in the study.

The questionnaire was divided into sections covering: household characteristics and status indicators, crop sales ,purchases and there seasonality in the agricultural marketing season 2004/2005.The marketing mechanisms , infrastructure, marketing obligations, services and the constraints faced in the intra rural markets. The questionnaire is presented as Appendix 1.The questionnaire was completed through interviews with the household heads that in this case were responsible for the major sales and purchases of the produced output.

Secondary data was also used in the study. The secondary sources included the local institutions supporting small –scale agricultural production and marketing in the area such as the ministry of agriculture and non-governmental organizations that offer institutional and technical support. Key informants from these institutions were interviewed to provide the data and a cross check for the data obtained from the small scale farmers. Both the data collected from the primary and secondary sources provided information for the framework for the analysis of the characteristics of intra-rural sorghum markets

3.4 Sampling Process

The simple random sampling technique was used to generate a listing of the study respondents. A list of beneficiaries in the Care International food distribution program for the whole of Kazungula district was used as the sampling frame. 50 respondents were

then selected from a total of 350 beneficiaries using a computer generated technique of random sampling.

3.5 Data Analysis

The data was analyzed using SPSS (statistical package for social scientists). Graphs and frequencies will be used to describe the data obtained and cross tabulations were used to show the relationships among variables. Chi-square analyses were used to analyze data recorded in categories in order to make comparisons among the variables as generated by the data. The results of the survey were presented as tabular descriptive analyses.

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter reveals the findings of the survey. It reveals the characteristics of the small holder farmer's surveyed and relates these characteristics to the market participation levels in the sorghum markets. age, education, gender and marital status are some of the social indicators that are analyzed. the economic indicators used in this study include; assets owned, off-farm and on farm income levels and the land holding. This characterization helps us to understand the various socio- economic characteristics that the various market participant's posses and therefore creates an understanding of the socio-economic factors affecting market participation in the sorghum markets by the small holder farmers. This chapter also reveals the nature of the sorghum markets with regards to the operations, mechanisms involved in sorghum marketing and much generally the characteristics of intra rural sorghum markets. The research was guided by the research study objectives as outlined in chapter 1 and the following hypothesis and assumptions were formulated to guide and aid in the analysis of the study objectives.

Objective 1

From the theory of marketing, in which we have producers, consumers and marketers of goods and services it was inferred for this study that in every market exists a continuum of marketing participants who may either be sellers of the goods or buyers as parts of the vertical linkages. Therefore with respect to the sorghum markets the following hypotheses were formulated.

Assumption 1

Small holder farmers are a heterogeneous group with regards staple crop marketing

In further identifying the characteristics of the smallholder farmers a number off socio economic indicators were compared across the identified market participation categories of the small holder farmers and thus relating household characteristics to market participation levels. This was done in order to analyze the unique socio economic characteristics that market participant's posses and hence create an understanding of the factors that influence the decision to trade in a particular crop and more so to participate at a particular level in the sorghum markets. The socio indicators that were used are discussed below and the hypothesis formulated included the following.

1 .Education level

Hypothesis 1

There is no relationship between the level of education and role in sorghum marketing.

2. Age

Hypothesis 2

Age of the small holder farmers is associated with role in sorghum marketing

3. Gender

Hypothesis 3

There is no relationship between gender and role in sorghum marketing

For the economic factors that influence trade, it is postulated that small holder farmers with a high economic leverage are more likely to participate as buyers and sellers of the staple grains owing to there economic status that makes them access inputs and other services much freely.

Since all the respondents used in the study are beneficiaries of the food security project in which inputs are provided, it was assumed that all the respondents had equal access to credit/inputs.

The economic indicators included in the analysis were:

1. off-farm and on farm Income Levels.

Assumption

The levels of on farm and off farm income of a smallholder farmer influence the role they play in the sorghum markets.

2. Assets

Assumption

The level of assets possessed by the small holder farmers the role the small holder farmers play in the sorghum markets.

3. Land holding

Hypothesis 4

The size of land holding is associated with role in sorghum marketing

4.2 Demographic Characteristics

The households surveyed included a wide spectrum of household types. Generally the respondents are subsistence farmers who mainly grow maize as the major staple for consumption. Sorghum is grown on a small scale. The respondents have been engaged in sorghum production for an average of 3 consecutive years. The household heads captured in the study are responsible for the major sales and purchases of the farm output, sorghum inclusive. Of the households that were sampled 72% of the household heads were

sorghum traders i.e. they either sold or bought sorghum. The remainder of the farmers, 18%, were non- market participants.

4.2.1 Age, Sex, Marital Status and Educational Level of the Respondents

The mean age of the agricultural households was 44 years.86% of the respondents were male and 14% were female. A majority of the respondents have attained a high school level of education. Refer to Table 1, below. 44% of the small holder farmers have at least attained secondary school education while 38% have attained primary school education with 18% having attained no formal education at all

Socially, these agricultural households have a majority of the household heads married. About. 86% of the respondents were married, 10% were widowed with 4% divorced.

Table 1 Age, Sex, Marital Status and Education Level of the Respondents

	Male	Female
Sex	86%	14%
Age (years)	44	39
Marital status		
Married	66%	20%
Divorced	3%	1%
Widowed	7%	3%
Education levels		
None	2%	16%
Primary	28%	10%
Secondary	42%	2%

Source: Own survey data

4.2.2 Economic Characteristics

The annual off- farm household income of 24% of the survey participants was less than K50, 000. 22% had an income of K50,000-100,000; 24% had an income of K100,000-K150,000; and 30% had an income greater than K150,000.The major off-farm income earning activities of most of the respondents included house building for a majority of the rural populous, charcoal burning, wood logging and small scale businesses in clothing and household utility supplies.

Additional income sources for the farmers are obtained from the sale of farm produce. A majority of the farmers earned K100, 000-K300, 000 of on farm income from the sale of there produce and this constituted 78% of the population. A further 10% of the population earned an income less than K500, 000 while 12% of the population earned an income less than K910, 000. These income levels reflect the types of crops that are grown by the small scale farmers. The respondents with an income level above K500, 000 were the respondents who are actively engaged in the production of cash crops particularly cotton and these farmers were predominantly found in Kazungula district. The majority of the farmers were particularly involved in the production of maize and due to the variability in yields, largely attributed to drought; the sales were affected reflecting on the low remittance from the sales.

The assets held by the respondents also formed a part of the economic indicators of the respondents.46% of the population held assets which included oxen, plough and livestock; 32% of the population however held the asset combination of oxen, plough, livestock and ox- cart; a further 16 % of the population owned the asset combinations of oxen, oxcart and livestock. 6% of the population owned the assets; 0xen and ploughs. This reflected that each household earned a plough and draught power is the labor.

4.3 Objective 1: Identification of the Major Participants in Sorghum Marketing

The first research objective concerned identifying the major participants in sorghum marketing.

It is postulated that small holder farmers are a heterogeneous group with regard to participation in the staple markets. The distribution of smallholder farmers across the markets varies greatly in terms of participation and the role that the farmers will play in the staple markets .to analyze the case of the intra- rural sorghum trade, a market participation categorical variable was created.

House hold status= 1, if the household is an exclusive seller

2, if the household is an exclusive buyer

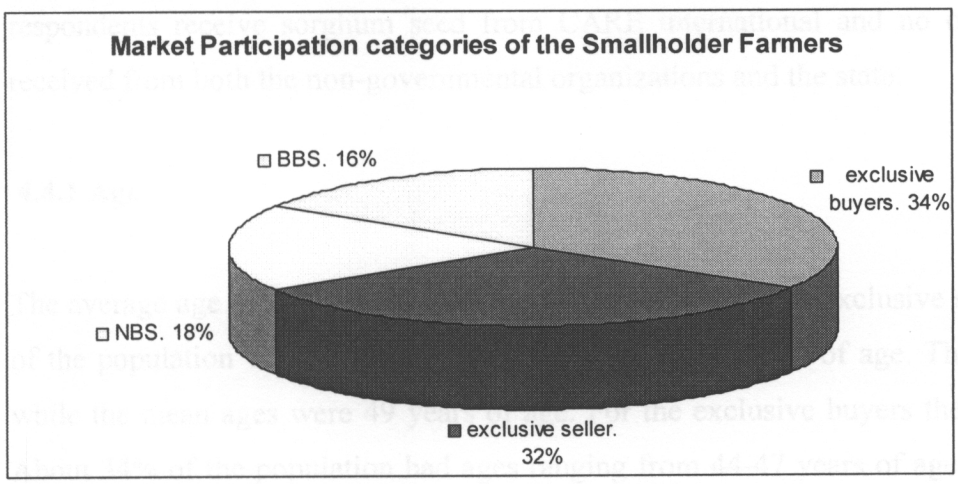
3, if the household is a non-buyer and seller

(Non- market participant)

4, if the household, both purchases and sells its output

A household is characterized as an exclusive seller if it only sells and doesn't buy any output. It is an exclusive buyer if it only purchases and doesn't sell any of this out put. It characterized as both buyer and seller (BBS) if it purchases as well as sales its out put. Finally a household will be characterized as non- market participant if it doesn't sell or purchase any of its output (NBS).refer to the figure below. With regard to these categories and intra rural sorghum trade, 34% of the households were exclusive buyers while 32% made up the sellers of the output.18% of the households were both buyers and sellers of the output while 16% of the households were non market participants in the sorghum markets.

Figure 1: percentage distribution of Market Participation Categories



Source: Own survey data

The results indicate that there are four major participants in the sorghum markets and these are the exclusive buyers, exclusive sellers, BBS and NBS. On average a majority of the small holder farmers participate in the buying and selling of the output and these represent in total 64% of the smallholder farmers. The remainder of the population is non market participants. Therefore a majority of farmers are engaged in staple grain marketing and a large proportion, are themselves buyers of the grain. The study therefore reveals that though the small holder farmers are the producers of the output and more so the sellers of the grain they simultaneously are the major buyers of the staple grain in the rural markets. Thus they constitute the major buyers of the sorghum grain.

4.4 Relating Household Characteristics to Market Participation

The characteristics of the small holder farmers participating in the sorghum market across the market participation categories were analyzed. The levels of off farm income, the on farm income, assets and access to institutional credit were some of the economic indicators used. At the social level, education levels attained; sex and marital status were used for characterization. Comparisons were then made across the market participation categories using cross tabulations and chi-square analysis in order to relate socio-economic household characteristics to participation in the staple market.

In this analysis access to institutional credit is the same across all the categories as the respondents receive sorghum seed from CARE international and no other inputs are received from both the non-governmental organizations and the state.

4.4.1 Age

The average age of the market participants was 44 years. The exclusive sellers had 78% of the population with there ages lying between 45-47 years of age. The mode was 46 while the mean ages were 49 years of age. For the exclusive buyers the modal age 45. About 34% of the population had ages ranging from 44-47 years of age. The other two categories of market participants had there ages below the sample mean age. The modal

age of the NBS was 45. 48% of the participants in this category lay within the age group of 38-40. The mean age of the respondents in this category of farmers was 38 years. The BBS had the same modal age as that of the exclusive buyers. However there mean age was 40 years of age. In this group 38% of the population lay between the ages 42-45 with the rest of the population having ages below this mean value.

Table 2 Age of the market participants

Market participation category	Mean age	Modal age	Range
Exclusive sellers	49	46	45-47
Exclusive buyers	46	45	44-47
Both buyers and sellers	40	45	42-45
Non buyers and sellers	38	45	38-40

Source: Own survey data

The results indicate that the exclusive sellers are the oldest and mature proportion of the smallholder farmers. This is followed by the buyers and both buyers and sellers. The age of the small holder farmer may therefore influence the decisions to participate in a certain market category with the older farmers with there much earned experience and established asset base participating as sellers and the younger farmers as non market participants.

4.4.2 Marital status

To further analyze the socio characteristics of the small holder farmers across the market participation levels, the marital status was compared across the four levels of participation. On the whole, 86% of the households were married, while 4% were divorced and 10% were widowed. The category of market participation which had the largest number of its population at 34 % being married was the buyers, as shown in table 2 below. This was followed by the sellers who had a proportion of its population at 32% being married.13% of the non participants were married with 60% of the population being divorced. Only 18% of those who both bought and sold the sorghum were married.

Table 3 Marital Status of the Small Holder Farmers across the Market Participation Levels

Market participation level	Married	Divorced	Widowed	Single
Exclusive Seller	32%	45%	33%	0%
Exclusive Buyer	34%	28%	38%	0%
Both Buyer and Sellers	18%	38%	44%	0%
Non Buyer and Seller	13%	33%	54%	0%

Source: Own survey data

4.4.3 Sex

The gender of the smallholder farmers was compared across the market participation categories. In this regard, the proportion of females in the class of exclusive sellers was 12.5% were as they constituted 23.5 % of the buyers. A further 66.7% of the females were the non-market participants and 12.5 % of the females were assigned to the category of both the buyers and sellers of the staple grain. Overall, only 14% of the females made the category of sellers and buyers of the grain, were as 86% of sorghum trade was male dominated. The distribution of males across the market categories was such that 76.5% of exclusive buyers were male and 87.5 % of the exclusive sellers were male. For the BBS and NBS, each group constituted of male participants at 87.5% and 77.8% respectively. Refer to table 4 below.

Table 4 Relationship between Gender and Level of Market Participation

	Male	Female
Exclusive Seller	26%	8%
Exclusive Buyer	28%	4%
Both Buyer and Seller	14%	2%
Non Buyer and Seller	6%	12%
Total		100%

Chi square=10.063, df=3, P=0.018

Source: Own Survey Data

The chi-square results indicate that gender is associated with the role in sorghum marketing. These results therefore show a relatively high proportion of males being involved in the selling and buying of sorghum grain as compared to the females who constitute a very large majority of the non market participants. This may indicate that females in intra- rural sorghum marketing are only marginally involved in the selling and buying of the grain which in most cases is a male dominated activity. They however represent a very large proportion of the non market participants. this may point to the fact that exclusiveness in selling and buying of the sorghum grain is biased towards the males and that gender does in fact affect the level of market participation in which case male participation is mainly across the levels of exclusive selling and buying whereas female participation is more likely to be represented as non buyer and seller of the grain.
From personal interviews with the farmers it was revealed that the role of the women in intra –rural sorghum trade is the selling of the processed sorghum grain as local brew I the farming communities and rarely as sellers or purchasers of grain which is a male dominated task.

4.4.4 Level of Education

To analyze the significance of the level of education on the market participation variable, it is postulated that households with highly educated members are more likely to make the commercial class of traders in staple markets. Cross tabulations are made relating the level of education with the market participation variable across the 4 categories. A chi-square test is then done to test the significance of the empirical observations. The following is obtained.
Households with highly educated members are often better placed to identify and pursue income generating activities than illiterate households. The levels of education attained across the market categories were compared and the empirical data obtained showed a relationship between level of education and role in the sorghum markets. The following was revealed.

Table 5 Level of Education Compared with Role in Sorghum Marketing

Level of education	Exclusive Buyers	Exclusive Sellers	Non Buyer and Seller	Both Buyer and Seller	Total
None	23.5	6.3	33.3	12.5	18
Primary	41.2	18.8	66.7	37.5	38
Secondary	35.3	75	0	50.0	44
Total	100	100	100	100	100

Chi-square =14.14, df=6, P=0.028

Source: Own Survey Data

The results of the chi-square and cross tabulation show that the level of education is associated with the role in sorghum marketing and this is significant at 5% probability level. From the chi-square analysis at the level of significance 0.05 the hypothesis is confirmed this indicates that house holds with highly educated members are often better placed to pursue income generating activities than illiterate households. The level of education therefore significantly affects the role that individuals play in market. The attainment of secondary school education increases the probability of the small holder farmers to engage in selling of the produced output, while at least a primary level of education increases the probability of the small holder farmers engaging as both buyers and sellers of staple grain sorghum. Having no education at all limits participation in the sorghum markets. Therefore with regard to the sorghum markets, the exclusive sellers have the highest level of education followed by the both buyers and sellers and lastly the exclusive buyers and the non market participants.

4.4.5 Assets Held

Households that have livestock and other productive assets tend to have considerable economic leverage than households that do not. This has a bearing on the productivity of the farmers and this will in turn determine how the small holder farmer participates in the sorghum markets depending on whether they will be enough surplus produce to enter the market. The assets that small holder farmers can posses was defined into 6 categories, and assigned the following numerical figures.

Asset owned by a household= 1 oxen, plough, livestock, oxcart

2, oxen, plough, livestock

3, oxen, oxcart, livestock

4, oxen, plough

5, oxen, livestock

6, livestock, plough

The most productive group of assets is the category 1 followed by categories 2 and 3 respectively. A majority of the farmers own the asset groups 1-3 the assets held by the small scale farmers were compared across the market participation variable the following was observed.

Table 6 Assets Possessed By The Small Holder Farmers

Market Participation Category	Category1	Category2	Category 3
Exclusive Seller	37%	55%	8%
Exclusive Buyer	36%	30%	34%
BBS	21%	15%	64%
NBS	4%	0%	24%
Total	100%	100%	100%

Source: Own survey data

The exclusive sellers have a high proportion of the households owning category 1of the assets, which is the most productive group of assets, and this category constituted 37% of the population. A majority of the buyers owned category 2, the second most productive assets, in this category at least 36% of the buyers owned this group forming the largest group owning category 1 assets. This was followed by the category of both the buyers and the sellers as the second largest group owning this combination followed by the sellers and the non market participants respectively. A majority of the non market participants and the both buyers and sellers owned category three, the least productive of the popular asset combinations held by the farmers.

The assets held by the small holder farmers becomes important in that they determine how much output can be produced at a given time and as such will determine the surplus produce that will be available to enter the markets for sales and alternatively if deficits occur they will indicate the need for grain purchases in the household during a given agricultural season. Therefore given the asset levels held by the small holder farmers the quantities of the sorghum grain produced by the farmers across the assets categories are derived. The table below gives the empirical distribution of the mean figures obtained.

Table 7 Relationship of Assets Owned and Quantities Produced

Category of assets owned	Mean quantities	Standard. Deviation
1	230.0000	35.35534
2	298.6364	239.52921
3	216.0000	109.30402
4	175.6667	132.91601
Total	256.4000	180.55199

Source: Own Survey Data

that as expected, a bulk of the sellers and buyers own at least, more productive assets than the non market participants and BBS.These relations support the fact that assets will give a degree of economic leverage to the small holder farmers.

To test the significance of the results observed. A mean comparison is done to relate the assets owned by the farmers and the quantities produced.

Table 8 Analysis of Variance for the Sorghum Quantities Produced

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	75909.576	3	25303.192	.035	.020
Within Groups	1521442.424	46	33074.835		
Total	1597352.000	49			

Source: Own Survey Data

From the analysis of variance table we observe that the f calculated value is 0.035 and the level of significance is 0.02. At the theoretical level of significance 0.05 the findings are significant and this shows that a relationship exists between the quantities produced and the level of assets held by the sorghum participants. This further suggests that farmers that produce high quantities of output given the asset base are more inclined towards participating as sellers of the output. The buyers are also characterized as being high producers of the sorghum grain this may be explained by the fact that the buyers are a wealthy group of farmers with high economic leverage this group is highly represented by farmers engaged in cash crop farming. As such usually have the means, financially to carry out such crop exchanges.

Both buyers and sellers produce relatively high quantities compared to the non-market participants who produce very little and as such rarely have surplus produce to trade in the markets.

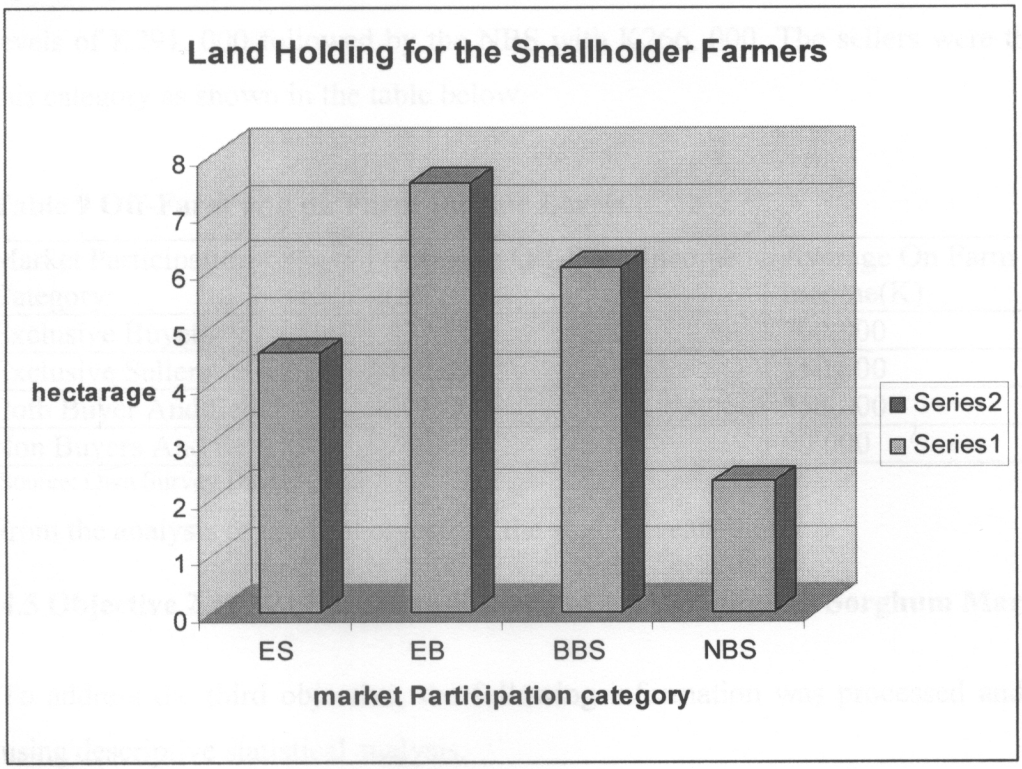
4.4.6 Land Holding

Land is the most important factor of production since almost all rural households depend on agriculture for there livelihood. Access to land and the ability to work the land has the potential to affect the livelihoods of rural households through yields, the extent of farming activities that can be undertaken and most importantly the ability to participate in the sorghum markets. If land is abundant the response to market signals differs from the responses of constrained agricultural land. The participation of the farmers is compared against the size of land holding of the farmers.

Land holding = all fields owned by the HH + virgin land + borrowed or rented land
Including land under fallow

We observe from empirical evidence that buyers have the largest land holding averaging 7.5 ha followed by the BBS with 6 ha .The sellers have an average land holding of 4.5 ha whilst the NBS have the lowest land holding of 2.25.refer to the table below.

Figure 2 percentage representation of the land holding of the small holder farmers



Source: Own Survey Data

The buyer of the sorghum grain are therefore have more landholding than the other market participants from personal interviews it was revealed that this group of small holder farmers are engaged in cash crop production and hence have a high economic leverage .the sellers have on average a smaller land holding than the BBS . The BBS Land holding is relatively higher due to there dual participation in the sorghum markets. The non market participants are on average subsistence farmers and hence have relatively limited land.

4.4.7 Off-farm and On-farm income Levels

The levels of on- farm and off- farm income are indicators of the economic status of households. For the off- farm income levels the following trends were observed among the small holder farmers. The exclusive buyers had a very high average of both the off-farm and on farm income levels amounting to, K332, 600 and K700, 000 and respectively. This was followed by the sellers who had an average of the off- farm

income levels K147, 250. However the BBS had the second largest on farm income levels of K291, 000 followed by the NBS with K266, 000. The sellers were the least in this category as shown in the table below.

Table 9 Off-Farm and on Farm Income Levels

Market Participation Category	Average Off-Farm Income (K)	Average On Farm Income(K)
Exclusive Buyers	332,600	700,000
Exclusive Sellers	147,250	150,000
Both Buyer And Sellers	291,000	350,000
Non Buyers And Sellers	266,000	90,000

Source: Own Survey Data

From the analysis of the first objective, the study reveals that

4.5 Objective 2 and 3: Nature and Levels of Participation in Sorghum Marketing

To address the third objective, the following information was processed and analyzed using descriptive statistical analysis.

- The organization of the sorghum markets i.e. whether marketing is centralized or decentralized
- Sorghum sales and purchases
- Seasonality of the sales
- Seasonality of the purchases
- Seasonal variations in the price of sorghum
- Marketing obligations and services that the small holder farmers provided
- Price of sorghum
- Mode of payments
- The market infrastructure was also examined as follows:

  Distance to the markets from the households

  Storage facilities available

  Transportation of the produce

  Processing methods

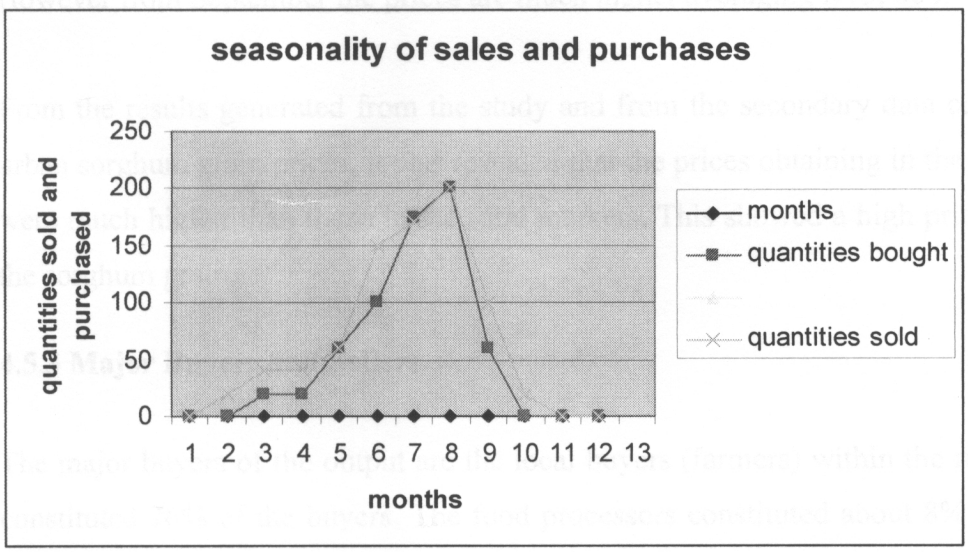
4.5.1 Sorghum sales and purchases

The average yield in the 2004-2005 agricultural marketing seasons was 250kg. By august the average quantity of sorghum that had remained in the stocks for use by the farmers mainly as seed for the following season was 60kg of the sorghum grain.
The quantities of sorghum that enter the market for sale can be determined as follows.
Marketed output t= yield - consumed product - recycled seed - transfers as gifts and exchanges.

Of this harvested quantity an average of 150kg entered as sales. Further an average of 100 kg of the out put is bought by the individual farmers in these rural markets.

4.5.2 Seasonality of Sales and Purchases

Figure 3 Seasonality of sales and purchases



Source: own survey data

The seasonality of sales and purchases took the following trends: most of the sorghum sales and purchases occurred in the periods of June- august and this took up 76% of all the major sales. Only 14% of the sales occurred in September to December which in most cases the stocks would have been finished.

Therefore sorghum marketing predominantly occurs in the months of June-august and by September no major sorghum sales occur.

4.5.2 Prices

The prices that prevailed in the sorghum markets were at an average of K12, 000/ 20kg tin of grain. The main mode of payment was by cash. 64% of all the transactions in the sorghum markets were carried out on a cash basis while 34% were done on barter basis involving exchanges with maize grain or cooking oil. Only 2% of the transactions were on a food for work basis.

The sorghum prices that prevailed followed the trends as those observed in the seasonal sales and purchases according to the laws of demand and supply. When the supplies for sorghum are low, triggering a high demand, the prices of sorghum increase. In the periods of June to September the sorghum prices fluctuate between K8000 to K 10,000. However from September the prices are much higher averaging K15, 000.

From the results generated from the study and from the secondary data collected on the urban sorghum grain prices, it was revealed that the prices obtaining in the urban markets were much higher than those in the rural markets. This showed a high price premium on the sorghum grain.

4.5.3 Major Buyers and Sellers

The major buyers of the output are the local buyers (farmers) within the region and they constituted 76% of the buyers. The food processors constituted about 8% of the buyers, while the urban buyers constitute 16% of buyers of the sorghum grain through the middlemen.

4.5.4 Marketing Obligations and Services Offered

The major marketing obligation that the sellers face included threshing of the sorghum grain and 78% of the respondents in the group of sellers provided this service. Another

obligation in sorghum marketing was cleaning of the grain and this was provided by 22% of the sellers of the output.

In ranking the most important obligation, 54% of the buyers ranked grain cleaning as the most important service that could be provided given the complexity of the cleaning and drying process. 38% of the buyers ranked threshing as the most important service were as 8% ranked thorough drying as most important in sorghum marketing, as it affected the milling process of the grain.

The results obtained point to limited development of the sorghum markets in which only a few services are provided to the small holder farmers. Only threshing of the grain is predominantly done by the local farmers which is a manual process and doesn't require the services of the processors. This points us to the following section.

4.5.6 Marketing margins

The nature of sorghum trade as the results indicate, reveal that the small holder farmers are faced with limited service provision and marketing obligations as indicated above. This makes the marketing margins to narrow down as there is little value addition to the sold output and more so no transportation costs are incurred by the sellers of the output as trade occurs at the farm gate. Similarly since market obligations are limited to threshing of the grain which is a manual task and performed by the sellers at no cost, the marketing margins are greatly reduced..

4.5.7 Access to Organizational Services

Most of the respondents have received some training and workshops on the following subjects. Market information, business development and crop production techniques. About 30% of the respondents had received information on market information, business information and crop production. Only 30% had received information on business development while 36% had received information on crop production and 4% had received no information at all.

About 82% of the exclusive buyers had received information on market information and business development. 62% of the sellers had received such information were as only 2% of the non-buyers and sellers and the category of both the buyers and sellers had received such information. See table below

Table 10 Access to Organizational Services

Market Participation Categories	Market Information	Business Development	Crop Production
Exclusive Sellers	62%	20%	18%
Exclusive Buyers	82%	10%	8%
Both Buyers And Sellers	2%	13%	85%
Non Buyers And Sellers	2%	23%	75%

Source: Own survey data

From the above results, we learn that the market information and business development techniques are more accessible to the buyers and sellers of the grain. The non market participants have limited access to such information which may attempt to explain there lack of participation in the sorghum markets and the exploitation by the seller and buyers of such information for the development of the small farm holdings into productive enterprises.

Further the above results point to the fact in the intra-rural sorghum markets information is available but the access to this information is limited among the small holder farmers. much as there is free flow of information among the small holder access is limited and this could be attributed to a number of factors such as illiteracy among the smallholder farmers.

4.5.8 Infrastructure

The storage facilities that are predominantly used by the respondents include the traditional storage means. The major problem that was highlighted in the use of this method was the stock bores and termites that damaged the out put. From the personal

interview conducted it was revealed that the presence damaged the grain to extents in which sale of the damaged produce was impossible.

One other aspect of marketing infrastructure is market accessibility and the respective distances to the markets. The following mean averages were observed as regards to the distances to the markets and the role the particular household played in the sorghum markets

Table 10 Distances to Urban Markets

Role In Sorghum Markets	Exclusive Buyers	Exclusive Sellers	Both Buyers and Sellers	Non Buyers and Sellers
Distance to the market(km)	125	25	126	168

Source: Own survey data

The distance to the urban markets affects accessibility to the wider and more developed staple grain markets .the sellers are the only groups of market participants with some leverage towards access to the urban markets which may begin to explain there role of participation, as access to the staple markets has some bearing on the decision to participate in the sorghum grain markets.

4.5.8 Objective 3: Processing Units

The processing units that exist in this region include milling and brewing of the output. An average of 46% of the respondents processed the output by milling at the local millers, were as 52% brewed most of this output. 2% of the respondents processed there own output. The average price of the milled grain was K2000 where as that of the brew was K200.this is another pointer to lack of development in the sorghum markets.

4.5.9 Objective 5: Institutional Support and Marketing Mechanisms in Sorghum Marketing

There are no major organizations that aid in the marketing of sorghum produce. However the major marketing organizations that exist are the co-operatives who market about 60% of the respondents produce. The co-operatives are largely predominant in Kazungula district. The channels that exist are the middlemen who purchase the produce for resale in the urban markets and across the borders. These purchased 30% of the respondent's produce. The government agencies only restricted purchases to maize grain.
The results there are no marketing channels in the sorghum markets extending beyond the grain exchanges between the smallholder farmers.

4.6 Objective 6: Constraints in Sorghum Marketing

The last objective addressed the constraints faced by the smallholder farmers engaged in intra-rural sorghum marketing the following results were revealed.

The major constraints that the respondents faced were grouped into four main categories as these formed the most popular problems faced by the small scale farmers. The frequency distributions were as below, where;

Table 11 Constraints Faced In Sorghum Marketing

	Number	Percentage
Lack Of Organized Markets	12	24
Price Differences	10	20
Limited Sorghum Markets	24	58
Variations In Quality Demanded	3	6

Source: Own survey data

The major problem that was faced by the smallholder farmers was the limited markets that are available for sorghum trade. A lack of organized sorghum trading was another problem that was identified by the small scale farmer; sorghum trade is carried out under

uncontrolled conditions and this lack of organization in sorghum markets hampers increased volumes of trade. Prices are uncontrolled there are no regulations in the markets that govern trade of the commodities and as such limiting expansion of the markets.

Another problem that was faced was the price differences in the rural and urban markets. Prices vary considerably in the urban and rural areas. Prices for sorghum are much higher in the rural areas averaging K12, 000 per 20kg tin as compared to the urban prices that average K 8,000 per 20 kg tin of sorghum this makes market expansion to the urban areas difficult as it becomes less profitable to trade in the urban areas.

Another problem that was highlighted was the variations in variety demands by thee sorghum buyers.

Different sorghum buyers require different variety specifications and thus affecting trade because much of the produce is rejected by the urban industrial users. This was a case in point the for Muyombo breweries an opaque beer producing industry and a major sorghum buyer who demand for the white sorghum variety were as the farmers produce the red seed variety. Another case in point was the traders from Botswana who demanded for the white short sorghum variety and only limited quantities of the red variety that sorghum farmers produce were available for sale. This thereby reducing the markets for trade.

4.7 Spatial variations in Sorghum Trade

The study covered three areas in Kazungula district in the southern province. These areas are; Nyawa, Kauwe and Msokotwane

Though these areas are in Kazungula district they are in close proximity to two different towns, Livingstone and Kalomo.The small holder farmers market there produce in these different towns and they are distributed as follows.

Nwawa- Livingstone

Kauwe- Kalomo

Msokotwane-Livingstone

4.7.1 Variations in the Nature of Trade and in the Trade Volumes

The mean distances of the three areas from the farmer's households are 33.5km from Kauwe to Kalomo, 113km from Msokotwane to Livingstone and 122km from Nwawa to Livingstone.

The composition of the small holder farmers in these areas is such that 42.2% of the farmers in Nwawa were exclusive sellers where as 15.2 % of these farmers were NBS. In Kauwe a large proportion of the farmers are exclusive buyers and 25% were NBS. Area 3 has 53.8% of the farmers as NBS 18.4% as exclusive sellers and 23.15 as BBS.
Therefore the farmers in Nwawa are predominantly sellers, buyers in Kauwe and NBS for Msokotwane.

Table 12 Quantities harvested in the three agricultural areas

Area	Mean	N	Std. Deviation
Nyawa	311.212	33	195.71595
Kauwe	112.500	4	25.00000
Msokotwane	161.538	13	76.79476
Total	256.400	50	180.55199

Source: own survey data

A mean comparison reveals the following. The smallholder farmers in Nwawa harvested a mean quantity of 311kg of sorghum in the 2004-2005 agricultural marketing seasons while those in Kauwe and Msokotwane harvested a mean of 112 and 161kg of the grain in the same marketing season.

Table 13 Quantities Sold and Purchased

Area	Mean Quantities Sold (Kg)	Mean Quantities Purchased (Kg)
Nyawa	108	25.4
Kuwe	15	50
Msokotwane	39	26
Total	95	27.6

Source: Own Survey Data

The following data was generated; the small holder farmers in Nyawa sold the highest quantities of sorghum at 108kg in the marketing season 2004-2005 as shown in table 11 above. They bought the lowest quantities of sorghum at 25 kg in this same period. The farmers in Kauwe bought on average 50kg of the produce and sold none whilst those in Msokotwane bought AN average 40kg of sorghum and sold an average of 27kg of the produce.

Table 14 Analysis of variance of the Quantities Purchased in the Season 2004/2005

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.724	2	1.362	0.039	.003
Within Groups	9.776	47	.208		
Total	12.500	49			

Source: own survey data

Table 15 Analysis Of Variance of the Quantities Sold in the Season 2004/2005

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	74356.177	2	37178.089	0.009	.045
Within Groups	869643.823	47	18503.060		
Total	944000.000	49			

Source: own survey data

From the analysis of variance the differences in the trade volumes in these three areas are significant and not due to chance. Hence confirming the postulation that spatial variations in trade volumes occur across certain areas.

The tables reveal that differences occur in the volumes of trade that exist in the different three different marketing areas geography of the area which affects its comparative advantage variations in trade occur among different areas.

4.7.2 Price Variations

Price variations in this region are also eminent; the average prices in Nyawa are K9, 183. In Kauwe the prices are on average K10, 250 whilst msokotwane has on average, prices of K12, 307.These price variations are subject to more changes due to seasonal variations in purchases and sales.

From the results obtained and on personal interviews undertaken the price variations across the three areas in the sorghum markets were due to distances between the three areas and also differences in the characteristics of the people living in these areas. The smallholder farmers in msokotwane have a high economic leverage than those in Nyawa and Kauwe owing to cash crop production the smallholder farmers are engaged in. the smallholder farmers in Kauwe are predominantly subsistence farmers. Sorghum consumption is preferred among the richer households

4.7.3 Seasonality of Purchases and Sales

The purchases and sales of the sorghum grain predominantly occurred in the seasons between June-august. However some trade continues to occur in msokotwane in September in which 30% of the sales and purchases occur in the region up to December when sales are completely halted.

4.7.4 Mode of Payments, Major Buyers and Sellers

The major buyers in nyawa are the local buyers and the sellers. The second largest groups of buyers in this area are the urban buyers who purchase this produce form resale in the urban markets. Refer to table 13 below. In Kauwe the sales are within the local areas the farmers are themselves the buyers of the produce and as such this area has no major buyers per say as they themselves are the buyers of the output.

Table 16 Major Buyers of the Sorghum Grain

	area			Total
Major buyers	1.00	2.00	3.00	
Locally	22	4	13	39
food processor	4	0	0	4
urban buyers	7	0	0	7
Total	33	4	13	50

Source: own survey data

The major buyers in Nyawa are the local buyers and the sellers. The second largest groups of buyers in this area are the urban buyers who purchase this produce form resale in the urban markets.

In Kauwe the sales are within the local areas the farmers are themselves the buyers of the produce and as such this area has no major buyers per say as they themselves are the buyers of the output. In Msokotwane, the major buyers are predominantly the local farmers within the area.

The common mode of payment in area 1 is by cash and this constitutes about 40% of the transaction in the area. In area 2 the major mode of payment is barter involving the exchange of maize, cooking oil and other such commodities with the farmers. In area 3 the major mode of payments is by cash and this constitutes about 38%.

Table 17 Marketing Obligations and Services Offered

Marketing obligations	in what town is your market located			Total
	1.00	2.00	3.00	
Threshing	13	0		19
Drying	0	4	0	4
Cleaning	20	0	6	27
Total	33	4	13	50

Source: Own Survey Data

Depending on the marketing activities in the area, the marketing obligations differ significantly. In Nyawa were most of the selling of the grain is predominant the major marketing obligations are cleaning of the sorghum grain as demanded by the food processors and the urban traders. In Kauwe the major marketing obligations is of drying the sorghum grain. In Msokotwane however the major marketing activities are threshing of the sorghum grain.

4.7.5 Services Received from any Organization

The services that the farmers receive are also different in the three areas and these have a bearing on the type of marketing activities that are prevalent in the areas. The farmers in Nyawa received market information, business development and crop production information packages. In Kauwe the information that these farmers have received is predominantly on market information and business development. In Msokotwane the information that has been received is that on crop production and marketing. Refer to table 18 below.

Table 18 Organizational Received by the Small Holder Farmers

Services received	in what town is your market located			Total
	Nyawa	Kauwe	Msokotwane	
Market info,biz development, crop production	11	0	2	15
market info, biz development	10	4	3	15
crop production, crop marketing	11	0	7	18
Total	33	4	13	50

Source: Own Survey Data

4.8.7 Processing Units in the Local Areas

The major processing units in area 1 are milling and this constitutes about 36% of the activities in the area. In area 2 and 3 the major processing units are the brewing of the sorghum grain as the major processing activities.

Table 19 Processing Units in the Local Areas

	in what town is your market located			Total
	1.00	2.00	3.00	
milling	18	1	4	23
brewing	15	3	8	26
threshing	0	0	1	1
Total	33	4	13	50

Source: Own Survey Data

4.8 Constraints Faced by the Small Holder Farmers across the Three Areas

The major problems faced by the traders in area one which constitutes a large proportion are price variations that exist in sorghum trade the prices vary widely in the urban and in the rural areas. Whilst the highest prices in the rural markets are at k12, 000 on average per 20kg tin of sorghum the highest prices for sorghum grain in the urban area are at K8000 per 20 kg tin in the urban markets. This therefore is a disincentive to market the produce to other markets. Further more these 20%traders in this area attributed variations in demand for sorghum as being the major constraints. Whilst the major buyers, the urban buyers and particularly Muyombo breweries demanded for the white grain the farmers have access to red variety of the sorghum grain.

The major constraints in Kauwe were attributed to a lack of sorghum markets and organized sorghum trade in the area. The Msokotwane traders however alluded most of there problems to limited sorghum markets in the area as the major constraints in the trade. See table below.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter reveals the conclusions and recommendations of the study. The conclusions drawn in this chapter a based on the summary of the findings and discussion that arose from the study. The recommendations are offered as solutions to some of the constraints that are identified in the sorghum markets and are offered so as to offer solutions and means of exploiting the sorghum markets so as ensure there growth and development

5.2 Conclusion

The government has achieved impressive development in its economic recovery and promotion of agriculture as the driver of economic growth in the country. The agricultural market liberalization and other government policy reforms have contributed to an increase in the number of agricultural commodity traders which in turn has increased competition an adept ingredient for market efficiency and thus economic growth. However promotion of diversified staple marketing still remains yet to be achieved. The maize staple markets have under gone considerable growth from being a government regulated market to a highly competitive market on the expense of the other staple markets such as the sorghum markets. In the study of intra-rural sorghum markets the following was revealed and the following characteristics attributed to the markets.

The sorghum markets are characterized as having low trade volumes averaging 250 kg for both sales and purchases, Much of the sorghum that is produced is consumed by the small holder farmers with very little of the surplus produce entering the markets for trade. The average price for the sorghum grain that exists in these markets is on average K12, 000. The major buyers of the sorghum grain include local buyers i.e. the small scale farmers themselves. The trade channels existing in this region are restricted to the local

grain processor that is the beer brewers who purchase the sorghum seed from the smallholder farmers. Other channels are restricted to trade flows from the farmers to the local grain processors. The urban buyers seldom purchase the sorghum grain owing to the higher sorghum prices that exist in these areas K12, 000 relative the urban grain prices which average K9, 000. The major processing units that exist in the sorghum markets are the grain processors and local brewers.

The smallholders are not faced with many marketing obligations or services in the selling of the produce. The major marketing obligation is threshing. The produce is not graded or packaged and since trade exists among the smallholder farmers there are no transportation costs incurred by the sellers as the sell the produce at the farm gate. Transportation costs are to some extent borne by the buyers who purchase the produce at the farm gate. The organizational services received by the sorghum traders include market information, business development and training in crop production mainly by Muyombo enterprises and care international. Seasonal variations also occur in the sorghum markets much of the sorghum sales occur in the months of May to June when high sale and purchase volumes occur. In the months of September to December no trade occurs. Much generally sorghum markets are highly constrained with the major constraint being a lack of sorghum markets. Also the sorghum markets have wide price differences occurring in the rural and urban markets. Much as the sorghum markets are highly undeveloped and inefficient the promotion of the sorghum markets is very vital to its economic growth and much more so in alleviating the food security problems that the country is facing.

5.3 Recommendations

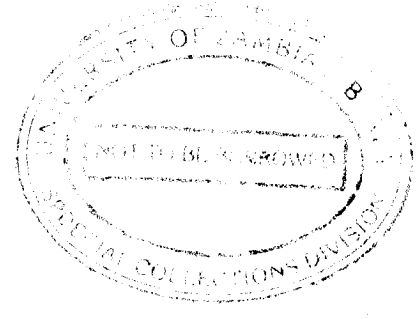
Through the creation of sorghum markets and enhancing the development of the sorghum markets, its production can be stimulated to increase and as such yield increases can imply more surplus food for both consumption and marketing. This can be achieved in the following ways. Policy formulations and implementation should be commodity specific in which areas such as the southern province which is more suited for sorghum

production are encouraged to produce the crop. This could be coupled with improved input accessibility through the provision of improved sorghum seed to the farmers to curb some of the problems of varietals demand by the urban buyers as sorghum is not an input intensive activity the government should consider revising the fertilizer support program in regions such as the southern province where the maize does not perform very well and rather concentrate on the production of sorghum and leave out the provision of fertilizer which in most cases is not put into productive use.

In enhancing market development in the region the formation of trading associations should be encouraged this will help the producers to access wider markets than the current levels and trade would be more organized following market discipline. Through the formation of trading associations the farmers would also be well able to access the booming agricultural based brewing and feed industries and hence would have a more wide market. These associations would also be more able to access the export markets to countries such as Botswana which have high sorghum demand

Further more the government should consider the inclusion of sorghum as one of the crops that could be purchased by the food reserve agency as a way of assuring the farmers of a ready market for there produce. This would help solve the problem of a lack sorghum markets.

Another important consideration is the promotion of contracting between the farmers and the growing beer and feed industries to help solve the problem of limited markets for the sorghum grain. More efforts should be invested in the provision and dissemination of market information on sorghum trade, potential sorghum markets and sorghum prices.
Quality appears to be the most common problem in commodity trading particularly because the farmers are not remunerated for quality and have no incentive to invest in quality enhancement mechanisms such as storage and drying facilities for the farmers. Also much investment needs to be placed in value addition for the sorghum grain.



Finally for the enhancement of the sorghum markets to occur much effort is required from all the major stakeholders for co-ordination and organization as investment in the sorghum markets may just be the solution to improved food security in the nation and consequently poverty reduction.

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APPENDICES

For official use

APPENDIX I SURVEY QUESTIONNAIRE

TITLE: CHARACTERISTICS OF INTRA-RURAL SORGHUM MARKETING BY SMALL HOLDER FARMERS IN ZAMBIA: A CASE OF CARE INTERNATIONAL ZAMBIA.

FARM HOUSEHOLD SURVEY

1.0 Demographics

1.1 Name of household head ----------

1.2 Sex of household head

a. Male [ ] b. Female [ ]

1.3 Age of house hold head ----------

1.4 Marital status

a. Single [ ] b. Married [ ]

c.Divorced [ ] d.Widow [ ]

1.5 Level of education

a. None [ ] b. Primary [ ]

c. Secondary [ ] d. Tertiary [ ]

2.0 status indicators

2.1 physical/capital assets owned

Description of assets owned	Does the house hold own any of these assets Yes=1 no=2
Oxen	
Ox cart Plough	
livestock Any other assets	

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2.2 Off-farm and on-farm income earned in the 2004/2005 agricultural marketing season.

Did you earn any off-farm income? Yes=1 , No=2	Important off farm earning income activity	How much did you earn form this activity	Important on farm income earning activity	How much did you earn from this activity

2.3 For how long have you been growing sorghum? ----------

2.4 What is the size of your sorghum field? ----------

2.5 What variety of the sorghum seed do you grow? ----------

2.6 What quantity did you harvest? ----------

2.7 Do you still have this crop in stock?

a. yes [ ] b. no [ ]

3.0 **Crop sales, purchases and the seasonality of the sales and purchases. 2004/2005 agricultural marketing season.**

3.1

Did you sell this crop last year.	Quantity sold	Major buyer	Price at largest sale	Did you purchase any crop this year	Quantity purchased	Price at largest purchase	Mode of payment

codes for section 2.0

2.1	2.5	storage	Respondents
Oxen=1 Ox-cart=2 Plough=3 Livestock=4	Kuyuma=1 Sima=2	Traditional=1 Improved=2	Yes=1 No=2

3.2 Describe the seasonality of sales and purchases by ranking in which months the sales and purchases are the highest.

Time of year	sales	Purchases
March-may June-August Sept-November Dec-February		

4.0 marketing mechanisms and infrastructure

4.1. What marketing channels exist in your local area?

a. organizations [ ] b.middle men [ ]

c. co-operatives [ ] d. government agencies [ ]

4.2. In what town is your market located? ----------

4.3. How far is the town from the market? ----------

4.4. Do you have problems accessing industrial users?

a. Yes [ ] b. No

4.5. If yes what? ----------

5.0 marketing obligations and services

5.1 What marketing obligations and services do you offer?

a. threshing [ ] b.drying [ ]

c.cleaning [ ] d. quality grading [ ]

e. any other specify ----------

Codes for section 3 and 4

Main buyer	Mode of payment	3.2	4.1
Locally=1	Cash=1	March-may=1	Org=1
Food processor=2	Barter=2	June-april=2	Middlemen=2
Urban buyers=3	Credit=3	Sept=nov=3	Co-op=3
Government=4	Food for work=4	Dec-feb=4	Govt agency=4

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5.2 What processing units exist in your local area?

a. milling [ ] b. brewing [ ]

c.threshing [ ] d. any other specify ----------

5.3 in what form do you process your output?

a. Meal [ ] b. Beer [ ]

c. Clean grain [ ] d. Any other specify ----------

5.4 What is the price of processed output? ----------

6.0 institutional/organizational support

6.1 What services have you received from any organization?

a. market information [ ]

b. business development [ ]

c. crop production [ ]

d. crop marketing [ ]

e. any other specify----------

6.2 Which organisation is the most important in the provision of these services?

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7.0 **Marketing constraints.**

What problems do you face in the marketing of your output?

Codes for section 5.0 and 6.0

Org services	Marketing obligations	Processing units	Processed form
Market info=1	Threshing=1	Milling units=1	Meal=1
Biz dvpmnt=2	Drying=2	Brewing=2	Beer=2
Crop prdtn	Cleaning=3	Clean grain=3	Grain=3
Crop mkting	Grading=4		