FACTORS INFLUENCING MARKETING OF AGRICULTURAL PRODUCE AMONG SMALL-SCALE FARMERS, A CASE OF SORHGUM IN GIAKI LOCATION, MERU COUNTY KENYA

BY

KOOME DENNIS KARANI

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DECLARATION

I declare that this research project report is my original work and has not been submitted elsewhere for examination.

Signature ……..……. Date……..

Koome Dennis Karani

L50/83711/2015

This research project report is submitted for examination with my approval as the research supervisor.

Signature ……..……. Date……..

Dr John M. Wanjohi

School of Physical Sciences

University Of Nairobi

DEDICATION

This research project is dedicated to my parents George Koome and Mary George, my two brothers Alex and Daniel for their support during the entire period of study.

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ABREVIATION AND ACRONYMS

FAO	--	Food and Agriculture Organization
ICRIAT	--	International Crops Research Institute for the Semi-Arid Tropics
MOA	--	Ministry of Agriculture
KARI	--	Kenya Institute Research Institute
EABL	--	East African Breweries Limited
JICA	--	Japan International Cooperation Agency
ROI	--	Return on Investment
KIRDI	--	Kenya Industrial Research and Development Institute
NGO	--	Non-governmental Organizations
USAID	–	United States Agency for international Development
GDP	--	Gross Domestic Product
ICT	--	Information communication technology
CBO	--	Community based organization
SCC	--	Swedish Cooperative Centre
NEPAD	--	New partnership for Africa's Development
NCPB	--	National Cereals and Produce Board
SPSS	--	Statistical Package for Social Science

ABSTRACT

Small scale farmers frequently consider marketing of their farm produce as one of their major problems. This study aimed at establishing the factors that influence marketing of agricultural produce among small-scale farmers, a case of sorghum in Giaki location, Meru County Kenya. The study embarked on the influence of middlemen as market link, road infrastructure, access to marketing information, and price on marketing of agricultural produce among small scale farmers. The research was conducted using descriptive research design and the data was collected using questionnaires. The target population consisted of all the 212 households which are involved in sorghum produce in Giaki location. These households are widely spread all over the three sub- locations in Giaki location namely; Mbeu, Thameri and Kambereu sub- Locations. The sample size was 138 sorghum farmers distributed among the three sub-locations as follows; Mbeu 52, Thameri 41, and Kambereu 45 households. The questionnaires were self-administered to the respondents. The data was analyzed using Statistical Package for the Social Sciences software (SPSS) and presented in form of tables. The variables were correlated using statistical methods. The study found that a large number of small scale sorghum marketers in the location are involved in sorghum grains marketing and they are not organized in group but market individually. Majority of smallholder farmers (89.5%) use middlemen as market link while marketing their sorghum produce. 96.2 % of the respondents felt that middlemen are exploitive to small scale sorghum famers. As a result of this the profit coming in the pockets of the farmer is very little. Majority of the respondents (69.1%) felt that middlemen as market link are important because they help the farmer's link with the consumers while saving the customers a lot of cost involved in marketing of sorghum produce. The study also found out that most of the respondents (52.6 %) use dusty roads when marketing their sorghum produce. This makes difficult to transport their produce to the market place during the rainy season. The study also revealed that 72.2 % use mobile phones as mode of accessing marketing information since it's convenience to everyone. 69.9% of the respondents get the information from the middlemen as their source. 66.2% of the respondents indicated that the middlemen are the one who set the prices of sorghum produce. Lastly the study found out that the largest number of the respondents (55.6 %) use mobile banking as mode of payment for their sorghum produce. It was established that there was a strong positive correlation between Access to information followed by price and middlemen respectively while road infrastructure had the weakest association with sorghum marketing .Moreover all the variables were significant at 95% confidence level with sorghum marketing, access to information being the most significant (P=0.019) and road infrastructure being least significant (P=0.048). Based on the findings the research recommends that there is a need for sorghum producers to be empowered in terms of access to marketing information, especially on the information involving prices and market availability for their produce. also there is need a for the government agencies who are involved in price setting of agricultural produce to intervene towards the price setting of sorghum grains as recommend by many respondents. This is because respondents feel that middlemen being the ones who sets the price for the sorghum grains they set prices which only favors them and hence gaining more profits at the expense of producers (small scale farmers). The results obtained in this study can be utilized in developing marketing strategies that can improve the livelihood of small scale farmers.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The challenge brought about by millennium development goals and the need to provide reliable and adequate food for the world population has led many people to embank into small scale farming (Eskola, 2005). The concept of small scale farming is further influenced by the fact that many agricultural lands have been sub-divided among family members who opt to plant different varieties of crops. In order to increase their income and improve their livelihoods, rural farmers engage in businesses by selling their agricultural produce. Some of these produce are exported for business purposes. Rao (2007)showed that agricultural growth is the principle direction to reducing poverty in developing countries, especially in rural areas.

Marketing of agricultural produce plays a critical role in meeting the overall goal of food security, poverty alleviation and sustainable agriculture, particularly among smallholder farmers in developing countries (Altshul, 1998). Makhura (2001) found that the market of small scale farmers is constrained by poor infrastructure, distance from the market, lack of own transportation means, middlemen involvement, and inadequate market information. A research carried out by Deliwe and Jason (2013) indicated that the economic challenges encountered by smallholder horticultural farmers include lack of transport and the high cost of hiring transport, unreliable and unpredictable market information, absence of proper storage facilities, unfair and unstable prices at the market and inability to access and penetrate profitable markets.

In a study conducted by Bernadette (2013) on challenges affecting marketing of horticultural produce in Kenya found that many farmers view middlemen has exploitive and gets more income from mango fruit sales than the farmers themselves. Only a few farmers were selling directly to exporters while many others sold to middlemen at farm gate. Those who sold directly to exporters made better income compared to those who sold to middlemen. Infrastructure, particularly road network was found to be inappropriate. The farmers indicated that the poor road network affected the market accessibility for their fruits and as a result they agreed that their income could be increased by improving road network.

In the case of Sorghum grains not much research has been done though it's the world's fifth most important cereal, in terms of productivity. Though sorghum can be grown on any favorable climate, it is primarily grown in areas experiencing low rainfall. Most of these areas are unsuitable for the production of other grains unless irrigation is available (FAO,ICRIAT , 1996)**.**Sorghum is unique in its ability to produce under harsh environmental conditions where other crops grow or yield poorly. It is grown with limited water resources and usually with low fertilizer supply or other inputs by a multitude of smallholder farmers in many countries (FAO 1995).

Even though Kenya herself in the strategic plan of Vision 2030 has identified agriculture as one of the key sectors to deliver sustainable economic growth and improved livelihoods for the poor in the rural areas, the sector continues to face several constraints at the global, regional and national level that require special attention. Sorghum being one of staple food crop for many low income households in Kenya, and is typically grown on small-scale farms, was previously used for home consumption. It is produced all over the country, even in areas with low agricultural potential. Sorghum can grow anywhere from sea level to 2,500 meters above sea level and requires a minimum rainfall of 250 mm per year and a minimum temperature of 10°C (Chemonics,2010).As human food, sorghum has many uses with some of its products being:*(sorghum pilau,ugali, chapati, porridge, bread, cakes and sorghum beverage among others)* as named by the locals(MOA,2007)**.** Other uses of sorghum include stalks as fodder and as fencing materials in addition to industrial uses as animal feed, making of industrial starch and for alcohol production.

In Kenya, sorghum production had been increasing since year 2009 especially in areas where rainfall reliability is low. This has led to impression that with proper packaging, the sorghum flour market could be expanded to larger retail outlets and export markets and in turn benefit the farmer (Chemonics, 2010).Furthermore, the Kenya Agricultural Research Institute (KARI) in collaboration with East African Breweries Ltd.(EABL), one of the country's leading brewers, is promoting the use of higher quality sorghum varieties, such as *Gadam* and *Sila* to supplement barley in beer production (Ochieng, 2011). This recent development has encouraged renewed interest in the money-making production of sorghum, as it offers farmers forecasts for higher returns.

Due to the view that there is ready market for the produce and good profits, the crop is becoming increasingly popular among farmers in Kenya (MOA, 2009-2012).Sorghum

production is no longer viewed has farming done by “low lives” in the community. Many people have taken it as agri-business with expectations of a lot of benefits or returns. The Meru community has also embraced farming of sorghum crop in a serious manner. This is practiced in lower part of Meru County where it is among the high potential areas for sorghum; indications are that many farmers are engaged in commercial production and that the farmers are not able to market or sell their produce to benefit them as they would wish. However, there has been very little or no research with regard to the factors affecting small scale farmers in marketing their farm produce sorghum farmers being included. There was therefore need to analyze some of those factors which influence marketing of sorghum produce as an initial step to finding the solution to increasing marketing efficiency among smallholder farmers in Meru county.

1.2 Statement of the Problem

Since independence, agriculture has been the backbone of Kenya's economy. It is mostly characterized by rural small scale farmers who take a portion of 89% of total food producers and despite the important role played by these farmers in feeding the nation, they remain the poorest section of the Kenyan society (Nyoro, 2009). Even if hopes for growth and poverty reduction through agri-business are huge, they face various factors while marketing of their farm produce which influence them in different ways. FAO (2005) demonstrates common factors that influence the marketing of agricultural products among the small scale farmers in Africa and the rest of the world. They mention factors such as high post-harvest cost, market accessibility, education, and government policy.

It should be understood that without good marketing the farmers will not be able to sell or trade hence they will not reap maximum returns from their produce. This means they will never improve from their poor living conditions assuming that farming is their only activity. Small scale farmers across the world frequently consider marketing of their agricultural produce as being one of their major challenges.Many studies have been conducted on other factors that influence the marketing of agricultural produce by small scale farmers but less has been done concerning marketing of sorghum produce among small scale farmers. Even though means of Accessing information by farmers means of linking farmers to market, road infrastructure and price factor of the market are critical and important factors in marketing of sorghum produce, there is no study which has been conducted in Giaki Location of Meru county, in relation to this factors.

Therefore this research study was focused on these factors and the influence they have on small scale sorghum farmers in marketing of their farm produce in Meru county bearing in mind that even though this commodity is of higher demand because of its diverse use, the lives of the producers who are the farmers in the rural areas of Meru County remain unchanged in some parts of larger Meru community Giaki location being a case in this research proposal.

1.3 Purpose of the study

The purpose of this study was to establish the factors which influence marketing of agricultural produce by the small scale farmers.

1.4 Objectives of the study

The study was guided by the following specific objectives

(i) To examine the influence of middlemen in the market on marketing of sorghum in Giaki Location

(ii) To find out the influence of road infrastructure on marketing of sorghum in Giaki Location

(iii) To determine the influence of access to information by farmers on marketing of sorghum produce in Giaki Location.

(iv) To assess the influence of prices on the marketing of Sorghum in Giaki Location

1.5 Research Questions

(i) How do middlemen in the market influence marketing of sorghum produce in Giaki location of Meru County?

(ii) How does road infrastructure influence marketing of sorghum produce in Giaki Location of Meru County?

(iii) How does access to marketing information by farmers' influence marketing of sorghum produce in Giaki Location of Meru County

(iv) How do prices influence marketing of sorghum produce in Giaki Location of Meru County?

1.6 Significance of the study

The results obtained in this research maybe important to the Government agencies including the ministry of agriculture that deal with agricultural marketing projects in Kenya. The findings could be used to review the strategies of marketing agricultural products among small scale farmers especially sorghum farmers in Giaki location of Meru County. This could offer insight into what needs to be done to make the agricultural marketing easy to small scale farmers so that they can reap maximum benefits from the same.

1.7 Delimitation

This research study was carried out for a period of one month to cover farmers who are involved only in sorghum production and marketing in Giaki location of Meru County. Also the structured questionnaire was administered to the sorghum farmers in Giaki location only.

1.8 Limitations of the study

In the cause of the study there was language barrier challenge from the farmers while answering the questions in the questionnaire. To overcome this challenge, the few of the community members in Giaki location who can read and understand English language were employed as research assistants. Those few community members helped in interpreting the information in the questionnaires to other farmers and for easy answering.

1.9 Basic assumptions of the study

It was assumed that most of the sorghum farmers had same problems in marketing sorghum produce. It was also assumed that the data obtained in this study is representative of all situations regarding agricultural produce by small scale farmers

1.10 Definition of significant terms

Access to information these are the means by which the famers get the information about the availability of the market for their produce.

Marketing of sorghum produce this is a business process where sorghum produce reaches the final consumer in the market.

Middlemen in the Market in this case refer to those people or group of people who buy sorghum direct from farmers immediately from the farm gates and go to sell in the market to the manufacturers. They act as a link between the farmer and the market.

Price in this case refers to the value given to units of the sorghum paid to the farmer by the buyer

Road infrastructure in this case refers to the type of transport used to transport sorghum produce to the market center or to the customer. These include dusty terrains, all weather roads, murrumed roads among others.

1.11 Organization of the study

The study is organized into five chapters. Chapter one deals with background of the study, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, delimitations and limitations of the study, basic assumptions and definitions of significant terms.

Chapter two contains introduction to literature review on sorghum marketing, middlemen and marketing of agricultural produce, road network and marketing of agricultural produce, information access and marketing of agricultural produce, price and marketing of agricultural produce, theoretical framework, conceptual framework, research gape and summary.

Chapter three, deals with research methodology this involves introduction, research design, target population, sample size and sampling procedure, instrument of data collection, pilot testing of the instrument, validity and reliability of the instruments, data collection procedures, data analysis techniques, ethical considerations, operational definition of the variables, references and appendices.

Chapter four provides key results from data analysis, presentation and interpretations. And the final chapter which is chapter five provides the summary of main findings, conclusions and the recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains the review of some of the studies that have been carried out regarding factors affecting marketing of agricultural produce. The literature is divided into two main categories, namely, Theoretical review and empirical evidence. The empirical review will further be divided into sub-categories that will focus on dependent and independent variables of the study. They are; agricultural marketing, influence of middlemen on marketing of sorghum produce, influence of access to marketing information on farmers in marketing for their produce, influence of road infrastructure on marketing of sorghum and influence of price on marketing of sorghum produce. The chapter is concluded with a conceptual framework gives the hypothetical relationship between the independent and dependent variables

2.2 Marketing of sorghum

Marketing of any farm produce is important. This is because the aim of any producer is to deliver the produce to the final consumer (Chemonics, 2010). Kohls (1985) Stated that agricultural marketing is the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumer. From this definition it can be seen that groups with varying interest will view marketing differently. Consumers will be interested in purchasing what they can at lowest possible cost and farmers it might be assumed, will be interested in obtaining the highest possible returns from sale of their products. The major reason why Kohl's definition is so relevant to agricultural sector is because it can be used to determine which business activities can be properly regarded as a neutral element by the farmer and this is worthy of his serious consideration.

In the world arena agricultural marketing is encouraged by the existence of the Agricultural advisory (extension) services which are a vital element of the array of marketing and non-marketing entities and agents that provide critical flows of marketing and market information that can improve farmers' and other rural peoples' welfare. After a period of abandonment, agricultural advisory service returned strongly to the international development agenda. Apart from their conventional function of providing knowledge for improved agricultural

productivity, and agricultural advisory services they fulfill a variety of new functions, such as linking smallholder farmers to high-value and export markets, promoting environmentally sustainable production techniques, and coping with the effects of HIV/AIDS and other health challenges that affect agricultural marketing (Anderson ad Feder, 2004)

The result of the study carried out by Asogwa and Okwoche,(2012) in Benie state of Nigeria for Marketing of sorghum produce showed that sorghum marketing is dominated by males and also sorghum marketing in the study area enjoys higher patronage by the young people who are energetic enough to with stand the stress involved the business. Most of the sorghum marketers in the study area of Nigeria were literate enough to give room for effective communication in doing their sorghum marketing business. Sorghum marketing in the area is structured in such a way that there is ease of entry and exit as well as freedom for buying and selling of sorghum in the study area. There is also sufficient and good knowledge of price information among the respondents. In addition, middlemen have much influence on marketing activities that take place within the study area.

Ameleke (2008) in a study on sorghum market integration in Ghana. They purposed to examine the variability in sorghum supply and prices factors affecting volumes or sorghum trade and whether the sorghum market was integrated. The author used a sample of 160 respondents. The study showed that the field sorghum marketing was organized by individual private traders with no barriers to marketing entry. According to KIRDI report Kaimo (2009) carried a study on rapid market appraisal on sorghum grain, competing value-added sorghum products in Nairobi and its environs. The study aimed at accessing the sorghum marketing in order to generate understanding of the grain and demand characteristics, prices, market places, value addition technologies and market actors. The study employed questionnaire in gathering data. In the study it was observed that poor packaging and labeling due to inadequate information on the importance of marketing strategy and lack of marketing plan were constrains in marketing. The author also found out that the most preferred unit of measurement was kilograms, since it's cheap and can be afforded by most consumers. The conclusion of the study was that researchers, policy makers and other stakeholders need to be aggressive in ensuring increased production and value addition of sorghum to ensure food security in the region.

2.3 Middlemen in the market and marketing sorghum

The concept market link is frequently used in marketing literature to denote a particular category of market participants mainly middlemen or brokers who are popular in the marketing field. A major problem is that the concept of a middleman or brokers as many call them is used to describe participants with quite different roles in the market system (Carl, 2010). As a result, the interpretation of the concept becomes unclear. Middlemen, and trading entrepreneurs who link the small scale farmers in developing countries to emerging markets nationally and globally, seem to be generally despised despite the economic service they provide. Without their capital and specialized knowledge, high prices in growing markets might be outside the reach of the small holder in the rural area, or of the home-based artisan in the urban slum. By bridging this gap, although for profit, surely they help to lessen poverty. And yet it is this profit motive, and the claim that these middlemen make excessive profits" because of market power (Carl 2010).

Middlemen have a bad reputation all around the world and especially so in the marketing of agricultural products in developing countries. Mainly by using their assumed monopsonists position and the low bargaining power of producers, middlemen are thought to take advantage of producers by offering them prices far below the market value (Thapa and Pokhrel, 2007). This has on a regular basis led to calls from policymakers, NGOs and producers for the elimination of the middleman as he is thought to be exploiting the poor producers through his behavior.

Mcmillan *et al*., (2004) studied the case of cashews in Mozambique, and reported that cashew growers only receive 40 to 50 percent of the border price, even after border taxes are allowed for. They go on to note. “It is clear that the marketing channels for raw cashew nuts remain imperfectly competitive. Farmers' incomes are depressed not only by transport and marketing costs, but also by the market power exercised by the middlemen traders”. Dare and Mortensen (2003) the concept or setup of middlemen is encouraged by a situation of farmers having imperfect knowledge concerning the market prices. On another study, Broadbet, (1985) stated that provided middlemen operate in an environment of strong competition it is unlikely they will make extreme profits. When the retail and producer prices are high, middle men try to control the market prices by reducing their market margin and when the prices are low middlemen try to get more benefits by increasing their market margin (Sandika, 2011). However, Broadbet, (1985) noted that, just like other businesses there are some middlemen

who are dishonest. The challenge is to identify middlemen of good reputation and to make sure that the marketing system minimizes opportunities for dishonesty.

USAID (2005) articulated that some farmers and middlemen may open new opportunities as they permit access to particular market segments. At the same time, the process of distributing market shares is accompanied by marginalization and exclusion, as middlemen may impose prohibitively high barriers on farmers in terms of short-run and long-run efforts needed for marketing (FAO, 2004).According to Mutota, (2011) linking of farmers to markets is necessary in order to overhaul the sub sector because the agricultural market/marketing in general is mainly being controlled by dishonest middlemen.

Hill and Fafchamps, (2005) found that producers facing great distances to the market and who only supply small volumes of produce were more likely to sell their crops at the farm gates to middlemen than directly at the market due to the high transportation costs involved. Being located further away from the market could also reduce the availability of information regarding market prices which would increase the risk of monopsonistic middlemen taking advantage of the producers. However, if competition exists among the middlemen their market power would be reduced as producers would have more possibilities of selling their crops and consequently reducing the risk of them being exploited (Pokhrel and Thapa, 2007).

In a study of Nepalese marketing of mandarins done by Pokhrel and Thapa (2007) failed to find any support for middlemen exploiting producers. This has also been the conclusion of several geographically diverse studies of agricultural markets (Enete, 2009); (Hayami et al, 1999). In a report on Bolivian potato farming Jones, (1984) instead found that the role of middlemen had an overall positive impact on producers and should be taken into consideration when policy for rural development was made. If middlemen are indeed not exploiting producers, they can be argued to provide valuable services such as transportation of goods and market access that other actors are either unable or unwilling to provide.

Those who critic of the role of middlemen in marketing argue that the opportunistic behavior of middlemen is expected to raise transaction costs and create imperfections in the market Woldie and Nuppenou (2011), and that their high margins in profits misrepresent the market by driving a block between the price paid to farmers and by final consumers (Tara, 2011). Farmers' production and marketing decisions may be sub-optimal due to risk aversion or

minimization interests because of price volatility due to high risk and uncertainty, which is partially attributed to middlemen participation. According to Getnet, (2008) middlemen are popularly viewed as “parasites”, that is, they do not create wealth or value because they do not actually create anything real such as a physical product or a direct service.

Those who are in support of middlemen involvement, reason that middlemen are responsible from moving products from producers to final consumers, as well as overcoming the time, place, and possession gaps that separate goods and services from those who need or want them (Kotler and Keller, 2009). Mesarić and Dujak (2010) say middlemen are important as a component of value chains in the function of consumption, production and competition development. Rubisten and Wolinsk, (1987) said that the role of middlemen is to reduce the time- preference losses that occur when agents must search for a trading partner. Watanable and Makoto, (2006) in middlemen visible market maker’s states that besides mitigating market frictions, the role of middlemen includes linking producers and consumers, setting price for competition as well as holding inventories to smooth trade imbalances among producers and consumers. Likewise, Davis & Stephen, (2012) in middlemen and marketing sees the role of middlemen as of value addition to both parties they transact with, making both better off and also that the connecting of willing buyers and sellers who do not know each other and would find it impossible or excessively costly to get to know each other is essential to a functioning economy.

2.4 Road infrastructure and marketing of sorghum

Transport is regarded as an important factor involved in agricultural development all over the world. It is the only means by which food produced at farm site is moved to different homes as well as markets. Good transport creates good marketing environment for agricultural produce, it encourages contact among geographical and economic regions and opens up new areas to economic focus. There are complex relationships that vary both spatially and over time between transport and development. However, for any development to take place, transport plays a crucial role.

Road transport helps in connecting rural areas to collective growth. Since the majority of the rural workforce in most developing countries are directly, or indirectly, dependent on the agricultural sector for employment, expanding the road infrastructure and improving its maintenance in rural areas can directly translate into lower transport costs for inputs (such as fertilizer) and market outputs, since it reduces the travel times for delivery to market and

reduces the frequency of transport damage (e.g. vehicles and produce). Gaining improved access to markets also helps farmers to achieve greater consumer demand for their produce. Both lower transport costs and higher demand raise the margin between sales prices and production costs, resulting in higher incomes and consequent welfare improvements for the rural population (GTZ, 2005).Ogunsanya (1981)states that there are three types of routes in the rural areas which are; bush paths, unsurfaced rural roads and surfaced rural roads. However, the bush path is very common but the least developed of all the routes. Bush paths link villages with farm steeds and they are usually narrowed, winding and sometimes overgrown by weeds especially during the rainy season.

Paul(2009)in crop production and road connectivity in Sub-Saharan Africa pointed out that the impacts of road infrastructure on agricultural output, productivity and marketing in general are very important in Sub-Saharan Africa for three reasons. They found out that; first, the agricultural sector contributes greatly to gross domestic product (GDP) in most Sub-Saharan countries. Second, poverty is intense in rural areas and finally, the relatively low levels of road infrastructure and long average travel time's result in high transaction costs for sales of agricultural inputs and outputs, and this limits agricultural productivity, growth and during marketing it proves to be so disappointing.

In a study carried by Filani(1993) in rural areas of Nigeria, it was discovered that where roads which can be used by motor cycle exist they are mostly of unpaved surface, narrow width, circuitous alignment and with low quality bridges. In most cases, they are either clad with potholes or characterized by depressions and sagging. Such unsurfaced roads are hard pass during the rainy season when vehicles get stuck in mud or when the improvised bridges of cut-free trunks get swept away by flood. This made it difficult for farmers to transport their farm produce In another study carried out by Ogunsanya(1988) on relationship between transportation, underdevelopment and rurality, he observed that the greater the degree of rurality, the lower the level of road transport development. Aderamo and Magaji (2010) noted that road transportation constitutes the main avenue through which different parts of the society are linked together. Jegede (1992) cited by Aiboye and Afolayan(2009) noted that road transport is the most common and complex network. It covers a wide range, physically convenient, highly flexible and usually the most operationally suitable and readily available means of movement of goods and passenger traffic over short, medium and long distances.

Transport affects agricultural marketing because it is the only means by which farmers can transport their produce to the market. Poor road infrastructure in the rural areas has resulted in low productivity, low income and a fall in the standard of living of rural residents and high rate of poverty (Aloba 1986).When the distance of farm to the market is far and the road is rough perishable crops may be destroyed and farmers may run at a loss. It is against this background that this study examines the impact of road transport on agricultural production in Ilorin East Local Government of Kwara State, Nigeria. Improvement of rural roads results in elimination of frequent road closures during rainy seasons, reduction in vehicle operating costs and increased traffic volume, ownership of motorized vehicles, access to market and social services, and improvement in passenger services(World bank, 1996).

Villages with Good road infrastructure have a significantly improved situation in terms of agricultural production and incomes compared to the villages with poor road infrastructure(Raisuddine and Hossain 1990).The improvements of feeder roads, bridge construction, and rural road routine and spot maintenance results in increased participation of vendors at local markets, increased variety of available agricultural products and the geographic size of markets for agricultural products (Lucas et al, 1990).Good road accessibility significantly reduces farm gate prices of manufactured goods and increase farm gate prices of agricultural goods (Torbjorn and Bharat 2012).

Head loading can play a considerable role in marketing of agricultural produce. Siebe (1999)observed in Makete in Tanzania that more people used a footpath to travel to a local market than by vehicle on a comparable road. Some villages preferred to transport a large proportion of their produce by walking instead of selling it to traders with trucks. This is because the traders would pay them less than they receive at the market. A footpath improvement in Makete was found to reduce travel times, increase transport loads and reduce accidents. This caused stronger market integration and reduced rural isolation. Sieber however found out that transport by walking is restricted by weight carried or distance to market if more than half-day walk is involved.

Households with poor access to road are confronted with wider price bands and are less likely to participate in markets, so policies towards integrating remote areas with urban areas through infrastructure development are needed (Torbjorn and Bharat, 2012). This raises speculations that poor road network among other factors could be contributing to huge price fluctuations in Giaki Location. Provision or improvement of transport services results in

reduction of transport cost and /Or travel time which in turn lead to increased production (IFAD, 2001).Similarly, Bhalla(2000) argued that the marginal cost decreases as a result of improved transportation. In line with this, improving transport in Giaki Location will likely raise profit margins of the sorghum farmers. Worldbank, (1994) terms transport as one of the factors of production. Local farmers of Giaki Location may benefit from improvement of roads because of the reductions in the cost of transporting agricultural products to markets.

In Kenya, farmers report that they pass roads in the rainy season with their ox carts, where trucks are stuck in the mud.

2.5 Information access and marketing of sorghum

Regardless of the importance of agriculture to economic development, small-scale farmers have remained poor and are not well linked to markets (Aina, 2007). Schemermeier and LightFoot, (2007) Argue that small-scale farmers are exploited and do not get a fair share of the final consumer price due to poor access to marketing information. Rural farmers mainly get marketing formation from their fellow farmers' through word of mouth Gordon and Kindness, (2001) the radio and through occasional meetings with extension agents and village leaders; they sometimes get information from magazines and newspapers (Manda 2002). Manda said that farmers don't interact with extension workers very much as there are few of them and they are mainly concentrated in urban areas.

Poor access to marketing information has left rural farmers exploited by other players in the chain. Rural farmers often don't know the prices of their produces at distant markets. And due to poor road infrastructure and financial constraints, they often cannot transport their produce to distant markets. The poor access to information influences the traders and middlemen to visit the farmers at their homes and local markets and make purchases there. In most cases, farmers negotiate based on the prices proposed by the traders or middlemen. Traders and middlemen cheat farmers by taking advantage of their lack of knowledge of market prices, poverty and weak bargaining power arising from illiteracy and low social status (Lightfoot and Scheuermeier, 2007). Intermediaries often ignore market norms and their pricing lacks transparency (Rao, 2007).Crowder, (1997) Found out that farmers' markets access is limited by costs (in terms of time and resources), illiteracy, lack of information and poor knowledge of marketing techniques.

Marketing information that is disseminated to farmers may not fulfill its objectives (Robbins and Ferris, 2004**).** Farmers seem to be more interested in time-specific and reliable maximum farm gate, off-lorry and retail prices of the nearest and the main neighboring markets rather than in wholesale price information. The farmers in Zambia indicated that information needed for decision-making by small scale famers included; gross margins for a given farm produce, potential markets, stability of the commodity market, availability and price of inputs and expected transportation costs for inputs(Mushigwani, et al, 2002).Some studies revealed that farmers who are benefitting from the price information services would be interested in other information as well, such as weather forecasts, advice on crop production and marketing and use of appropriate seeds and fertilizers (Awasthi, 2007). Also Mosop (2015) carried a study in Mwingi district and found out that Information on price of sorghum affected the volume of sorghum sold. In his study he found out that Farmers who get information on prices of produce in the market earned high income compared to those with no price information of sorghum produce.

Terero, (2011)Proposed that one way to link farmers to markets is by improving physical infrastructure such as; information technology that connects smallholders to markets and reducing transaction costs and minimizing risk. In supporting the proposal, Prakash(2008) and Rapusas, (2008)insisted on using technology to link farmers to markets information. Famers can access information from various sources.

2.5.1 Mobile phone technology as a source of marketing information

Agricultural Stakeholders including small scale farmers use different ICT applications and tools at different stages of agricultural value chains, from pre-production to advisory services, marketing and consumption. Different scholars like Jayaraman and Dixie, (2011), Mototay and Furuholt, (2011) have highlighted the importance of services provided by mobile phones in enhancing the agricultural supply chain. Halewood and Surya , (2012) Acknowledged five areas in which mobile phones can be useful to farmers in enhancing agricultural supply chain. Their findings are as follows: Access to timely information: Mobile devices improve access to timely information about prices, market and farming practice, it gives more efficient and transparent markets, Make the process efficient and transparent, reduce waste and empower smallholders in negotiation with traders, and link smallholders to distant markets and higher end agricultural value chains, they also give advance warning like warning of weather risks, pests and other environmental risks and provide timely, locally relevant information on how

to respond to these, Access to complimentary services: and finally it facilitate access to vital complementary services, particularly financial services, General communication and co-ordination: the vital benefit of mobile phone technology is that it help the rural poor to connect with one another for more effective collective action as producers, traders and citizens.

The use of mobile phones for marketing by small scale farmers is substantial. Donovan (2011) reported that mobile phones help to increase income, improve efficiency of marketing, reduce transaction costs and offer a great opportunity for innovative interventions. The World Bank study in Philippines found strong evidence that purchasing a mobile phone in rural area is associated with higher growth rates of incomes among farmers (Labonne and Chase 2009). This finding reflects the evidence that farmers equipped with information have stronger bargaining power and can access a number of markets at the same time.

Mobile phones have a greater impact on price dispersion across markets. The impact is bigger where traveling costs are higher, especially in rural areas connected by unpaved roads. A study by Jensen (2007) in Kerala, India found that mobile phone coverage alone led to significant market efficiencies: the difference in prices across markets declined, as did waste; fisher's profits increased by 9% and consumer prices declined by 4%. Another study done by Japan International Cooperation Agency (JICA) in Uganda on the banana market found that mobile phone coverage rose information flows and encouraged farmers' market participation (especially for those living furthest from markets) (Yamano and Muto, 2009) .A similar study by Alker(2008) in Niger on the effect of mobile phone service penetration on grain markets found reduced market price dispersion across markets by 10%. The study also found that grain traders began trading in more markets once they had mobile phones, had more market contacts and their profits increased by 29%.

Farmers in the Kinangop region of Kenya using M-Farm a mobile phone marketing application for collective selling are said to have received more than double the price for certain types of produce (such as snow peas and sugar snap peas) than what they got for them when they were selling them individually. The feedback from farmers using the service has revealed that access to current market information has given them a transparent bargaining platform to use when selling individually to brokers or middlemen (Woodard 2012)

2.5.2 Agriculture extension officers as source of marketing information

Agricultural extension is the practice of gathering, developing and sharing knowledge about farming and rural livelihoods with rural a population which was traditionally defined as the delivery of information and technologies to farmers (Donner, 2009). This is based on the idea that 'modern' knowledge and information is transferred through extension agents to recipient farmers. The purpose is to help farmers increase their production and marketing knowhow. The recent training and visit (T&V) approach operating in more than 40 developing countries provides continuous feedback from farmers to extension agents (Ponniah, *et al*, 2008). Extension agents physically visit farmer's and engage in knowledge and technology transfer. It emphasizes the dissemination of simple, low cost, improved practices and it teaches farmers to make best use of available resources and information. The T&V approach also uses the technology of radio and TVs thus allowing for rapid and low-cost dissemination of agricultural knowledge or information according to Ponniah and company

2.5.3 Non-profit organization (NGOs) as source of market information

Many NGOs and community-based organizations (CBOs) target the rural poor, whose livelihoods are generally focused on primary agriculture or trade. These help rural farmers to access agricultural inputs, marketing information and link them to market (Kindness and Gordon, 2001). For example, the Swedish Cooperative Centre (SCC) helps farmers in Zimbabwe solve their agricultural problems collectively and share information on agricultural marketing and market their produce together, which give them power to negotiate for better prices for their products (Moyo 2009).

2.6 Price and marketing of sorghum

Price contributes much toward achievement of small scale farmer's development though this is measured by considering price if it covers the cost of production (Hans 1999). For example, when the price of agricultural product is good or high compare to the cost production result to the high profit to the producer of agricultural product. Farmer maximize their profit this is due to Return on Investment (ROI) which is high than cost of production, increase per capital income of farmers hence reduce the poverty, increase the production (output) due to capital accumulation, maximize market share, increase cash flow of the producer, effective planning and decisions making on production and reduce the risk of loses.

According to Normans and Collins, (1959) in the past years, the selling of agricultural products was done within an open market system using prices as the director of economic

activity. Prices, serving as the language or set of signals employed, were determined on such markets as the grain or fruit markets exchange or transactions were completed by the representatives of many buyers and sellers. Whatever little personal contact took place between these parties usually occurred at time of exchange. Each grower made his/her adjustment to buyers' requirements after translating the market's evaluation of alternative product offerings, hopefully conveyed by price, into a set of specific production practices.

Until a decade or so ago, for smallholder farmers, major markets were organized by governments, and exchanges were not critically influenced by farmer knowledge and organization. Nearly everywhere the situation has changed radically. Smallholder farmers no longer face an assured market for their produce at fixed, pan-territorial prices that often represent a large tax on the value of their produce. Similarly, they no longer face predictable supply situation for inputs and, in today's world, they may not be able to afford to buy what becomes available. A market environment offered farmers some degree of security, though far from perfect, has been replaced by a new one that is highly uncertain with regards to prices. New commercial relations must be struck with a myriad of suppliers and buyers (NEPAD, 2002). As shown in Jensen, (2007), Lack of information about the market price also implies that farmers may choose a sub-optimal composition of goods to produce (and sell) for instance where relative prices are not equal to the marginal rate of transformation. To the extent that farmers sell directly on the market, asymmetric information can result in large price differences across geographical markets leading to exploitations by other traders.

Normally, traders pass through villages on bicycles and pick-ups procuring agricultural produce at farm-gate prices on a cash basis. Traders either work independently or as agents of larger urban traders. Since traders travel back-and-forth to the market, while farmers rarely sell their output on the main district markets, sellers generally have less or little information about current prices while buyers are often well-informed, at least about the price in the district market where they are active (RATES, 2003).In Botwana according to Rohrbach *et al*., (2000) the wholesale and retail prices of sorghum produce differ depending on scale of operation as well as the size and location of the Market. Larger Producers competing for consumers in urban and peri-urban markets tend to offer the lowest prices for sorghum products. This brings about unfair prices to the small scale producers in the market.

Mitra and Sarka, (2003) investigated the potato markets in West Bengal. They find that, while farmers earn very small profits for traders have exhibit substantial mark-ups for their

commercial activity. They argue that these differences in profit margins are likely to be a consequence of traders' informational advantage. This makes the famers not to earn good profit hence they fell less motivated.

Huka (2014) studied on price fluctuations of agricultural products and its impacts on small scale farmers in Kilimanjaro Tanzania. In their findings it revealed that development of small scale farmers depend entire on the price stability of their farm produce, the study identified that Finding also revealed several contribution of good price to farmers such as increasing farmers income, motivating farmers, effective utilization of resources, improving farmers livelihood as well as enhancing the use of better farming and marketing technology, the study also identified several measures of preventing price fluctuation, government price control, improvement of farming infrastructures, provision of subsidies and proper storage system. In another study Frafchamps, (2008) analyze coffee markets in Uganda. They found that while increases in international coffee prices readily translate into higher export and wholesale prices, but imply much smaller increments in the prices paid to farmers. They posit that traders take advantage of farmers' ignorance about price movements though the little increment increases the market for the produce.

The pricing and marketing for sorghum and all other cereal crops in Kenya are open, except for maize, which the government continues to regulate through the National Cereals and Produce Board (NCPB). Despite the policy focus on staple food crops in recent years, many of these commodities, including sorghum, continue to face non-tariff trade barriers, such as road blocks, multiple county cess and levies, which hamper their competitiveness both domestically and regionally reducing their profit (Chemonics, 2010).Chemonics(2010) due to a lack of reliable producer prices for sorghum in Kenya, average annual wholesale prices in primary markets within five production zones of western Kenya namely: Busia, Kisumu, Nakuru, Eldoret and Kakamega, were taken as the farm gate prices for years between years 2006-2011. They were selling at (15ksh in 2005), (14ksh in 2006), (15ksh in 2007), (23ksh in 2008), (31Ksh in 2009), (26ksh in 2010), and (32ksh in 2011) this shows how un-stable the sorghum prices are. These prices were obtained from Kenya's Ministry of Agriculture, Agribusiness Department. Since data was not available for 2005, the farm gate price in this year was estimated using the average ratio of wholesale to farm gate prices for the period 2006-2011.

Mosop (2015) in his study on evaluating factors affecting marketing of sorghum in Mwingi District where he included Price of sorghum as a variable on assumption that price influenced the volume of sorghum sold in the market. He found that when prices fall few farmers are willing to sell their products and when prices increase there is a large volume of products in the market. In this study we will try to find out the relationship which exists between price which is one of the independent variables and marketing which is the dependent variable. This will involve how the prices are determined.

2.7 Theoretical framework

The marketer McCarthy, (1960) proposed a four Ps classification which have been widely used by marketers. They were; product, price, promotions and place. Since then the four Ps have been expanded to seven Ps to include; physical evidence, people, and process. The marketing mix-tool is used in marketing by marketing professionals (Farook, 2011). The marketing mix is often crucial when determining a product or brand's offering, and is often one and the same with the seven Ps to address the different nature of services: product, price, place, promotion, people, physical facilities and processes.

In this study the product is sorghum produce. The sorghum produce can be sold as fodder for animals in form of plants themselves after harvest or before harvest and also as grains after harvest for further processing in the market. In Giaki location sorghum produce are mainly sold as grains which will be consumed by human and also the plants as fodder for animals after or before harvest in the local market and for export markets.

The *price* element of the marketing mix is characterized by what is being charged for sorghum produce at the farm gates. The pricing aspect not only affects the income that a farmer derives from his/her produce sales, but also affects consumer’s perceptions of the quality. Prices are based on the law of supply and demand. It implies that as supply increases the price will tend to drop or vice versa, and as demand increases the price will tend to increase or vice versa.

Place is the distribution method that the farmer adopts to provide the sorghum produce to the market in a manner that meets consumer expectations. The development of option modes of distribution has grown considerably; no longer are the consumers confined to the particular place to get the produce.

Promotion encompasses all the tools that farmers can use to provide the market with information and also get information from the market concerning what they are offering: advertising, publicity, public relations, media technology and sales promotional efforts. When one considers the wide variety of publics with which a farmer needs to communicate, the use of just the middlemen is likely to be ineffective. In this study researcher will investigate on means of accessing marketing information and also dispersing information to the market.

The *people* element of the marketing mix includes all the group of actors that are involved in buying and selling of sorghum produce. George and Rust, (2003) explains that where the microstructure of trade in a product is determined, buyers and sellers of a product who wish to trade can choose between middlemen and specialist. However in this study we will use famers as the people.

Physical evidence is the tangible component of the service offering. A variety of tangible aspects are evaluated by a farmer's target markets, ranging from the infrastructure to the packaging of the produce. As transport cost decreases, the prices fall resulting in increased demand for input use or more output supply according to microeconomic theory (Varian, 1992). Most parts of Kenyan's agricultural areas are affected negatively by transport costs since such costs are very high (GoK, 2003).

Processes are all the administrative and technical functions of sorghum marketing: from the harvesting to consumption of the sorghum products. While this might seem quite straight forward, there are numerous other processes that need to be implemented concurrently (with the payment system, transportation, preservation and storage) to ensure the highest quality of the produce and consumer/customer satisfaction.

2.8 Conceptual Framework

Figure 1 shows conceptual framework on the marketing of agricultural produce in Giaki location in Meru County. It conceptualizes that marketing of agricultural produce such as sorghum grains in Giaki location in Meru County is dependent on accessibility of marketing information role of middlemen, and road infrastructure.

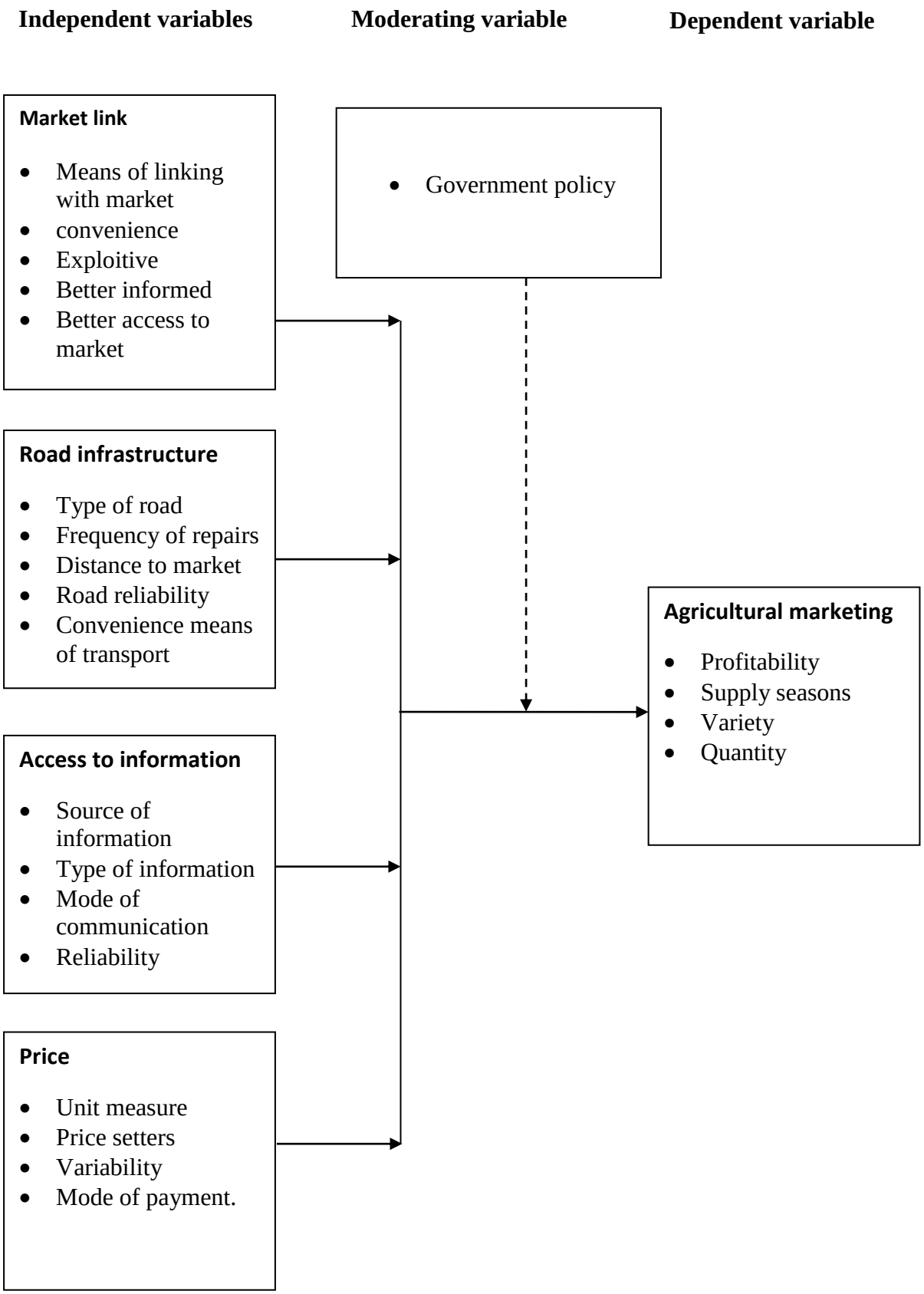

Figure 1 Conceptual Framework

2.9 Research gap

Middlemen as a marketing link are popularly viewed as "parasites", that is, they do not create wealth or value because they do not actually create anything real such as a physical product or a direct service (Getnet 2008) hence they should be avoided (Mututo 2011**)**. while other Authors like, Davis and Stephen, (2012)sees the role of middlemen as market link as of value addition to both parties they transact with, making both better off and also that the connecting of willing buyers and sellers who do not know each other and would find it impossible or excessively costly to get to know each other is essential to a functioning economy, hence it is important to encourage them. It was therefore important to establish whether middlemen are necessary in marketing of sorghum produce in Giaki location.

2.10 Summary

Small scale farmers in developing countries face number of factors when marketing their farm produce, hence it is important to take actions on some of those important factors that influence the marketing of their produce ether positively or negatively. A number of case studies emphasized that one of the factors that influence marketing of farm produce by small scale farmers is access to information. They have indicated that when farmers have information about market prices and source of their customers they gain an improved profit. Also farmers from rural areas mainly use road transport. Some of those roads as seen from these studies are dusty terrain. This provides a challenge to the farmers who suffer when transporting their produce to the market place or to the consumer. It's seen that middlemen take advantage of the situation and exploit the farmers through unfair prices.

Another thing which has come up in the literature review is that most farmers in spite of them being the producers they don't determine the prices to sell their produce. Rather the prices are set and determined by the middlemen/brokers who act as market linkers and hence buy on the farm gates.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains: Research design, target population, sampling or the respondents of the study, research instruments methods of data collection procedures and methods of data analysis, operational definition of variables and ethical issues.

3.2 Research design

Orodho and Kombo (2002) view research design as the arrangement, or plan that is used to produce answers to research problems. This study has used descriptive design since the questions raised in the study require collecting information by interviewing or questionnaire. Descriptive research design is meant to explain state of relationships as it exists. Kerlinger (1969) points out that descriptive studies are not only limited to fact finding, but often results in the formulation of important principles of knowledge and solutions to significant problems. A research design involves measurement, classification, comparison and interpretation of data.

3.3 Target population

A target population is a group of individuals, objects or items from which samples are taken for measurement (Donald and Delno, 2006). The target population consisted of all the 212 households which are involved in sorghum produce in Giaki location. The location is made up of 3 sub- locations namely; Mbeu,Thameri and Kambereu sub- Locations which was distributed as follows; Mbeu 80, Thameri 63, and Kambereu 69.

Table 3.1 Target population

Sub-location	Frequency	Percentage
Mbeu	80	37.7
Thameri	63	29.7
Kambereu	69	32.6
Total	212	100

3.4 Sample size and sampling procedures

Sampling is selecting a number of individuals from the target population for a study in such a way that the individuals selected fairly represent the larger population from which they were selected (Mugenda and Mugenda, 2003). This is because working with sample reduces the

length of time required to complete the study, cut cost and reflects the target population. This section describes the sample size and sampling procedure that was used in the study.

3.4.1 Sample size

The study used purposive sampling to pick Giaki Location in Meru County as the area of study this is because sorghum farmers within Meru County are more in Giaki location. The sample size was achieved using this formula which was developed by (Yamane,1967).

$$n = N/\{1 + (Ne^2)\}$$

Where n= the desired sample size

N= population of the study (total number of households involved in sorghum)

e= sampling error

According to Mugenda and Mugenda , (2003) confidence interval can be taken as 95% allowing for 0.05 error tolerance margin.

Solution= $n = 212/\{1 + (212 * 0.05^2)\}$

$= \frac{212}{1.53} = 138$

The sample size was 138 small scale sorghum farmers in Giaki Location which is 66% of the target population.

3.4.2 Sampling procedure

A combination of probability and non-probability sampling methods was employed to arrive at the respondents for interviews. The study used same sampling criterion to determine sample size per sub location. After a suitable sample size for every sub location was established the researcher employed systematic sampling technique in picking the farmers who were interviewed. The names of the farmers were arranged numerically then randomized and respondents were determined through systematic sampling technique. Population proportion sampling procedure was used to distribute respondents to the 3 sub locations in Giaki Location. Proportional sampling (VanDalen 1979) was appropriate for this study because it provided the researcher away to achieve even greater representativeness since selection of individuals was accomplished by selecting individuals at random from the sub locations in proportion to the actual size of the population in the total population.

Table 3.2 Sampling Frame

Name of sub location	Total households	Criteria used	Sample size
Mbeu	80	$\frac{80}{212} * 138$	52
Thameri	63	$\frac{63}{212} * 138$	41
Kambereu	69	$\frac{69}{212} * 138$	45
Total	212		138

3.5 Data collection instrument

The main tool for data collection in this study was questionnaire. A questionnaire is a research instrument that gathers data over a large sample (Kombo and Tromp, 2006). The questionnaire was divided into sections addressing the study objectives. A questionnaire was used since the study is concerned with variables that cannot be observed directly, ie people opinions and feelings. Such Information was best collected through questionnaire (Touliatos and Copton , 1988). The questionnaire was divided into section; section A (obtain information on socio- demographic characteristics of the respondents), section B (General questions on Sorghum marketing) section C (middlemen as market link and sorghum marketing), section D (access to marketing information) and section E (Road infrastructure and sorghum marketing) and section F will be (price and sorghum marketing). In the study both qualitative and quantitative data was collected through questionnaires.

Although Bourque and Feder (2002) assert that questionnaires are used to collect data from people who complete the questionnaires themselves, the research assistants in this study used the questionnaires to carry out interviews with farmers. Unlike in a posted questionnaire, this interview process will ensure direct communication with respondents. In this case, there was clarity whenever a question posed to the interviewee was not clear. Information from respondents who don't know how to read and write was also captured using this method. An interview provides the platform to gain cooperation, hence there is minimal loss of information (Leedy and Ormrod, 2005).The method also ensured avoidance of spoilt or lost questionnaires. Timely response was also achieved using this method.

3.5.1 Pilot testing of the instrument

Nachimias and Nachimias (1992) noted that pilot testing is an important step in the research process because it reveals unclear questions and instructions in the instruments. It also captures important comments and suggestions from the respondents that enable the researcher to improve the efficiency of instruments to maximize response rate. To ensure data collection instruments are reliable, a pretesting and practical interviewing was conducted. The sampled sorghum farmers for pre-testing were drawn from the 3 sub-location where the sample size is drawn from.

According to Connelly (2008), extant literature suggests that a pilot study sample should be at least 10% of the sample projected for the parent study. While Hill (1998) suggested 10% to 30% of participants for pilots in survey research is good. The respondent for pilot study was expected to display similar characteristics as the actual study respondents.

In piloting the Instruments questionnaires were administered to 22 small scale sorghum farmers which are 16 % of the sample size. They were sampled randomly from the 3 sub-location in Giaki Location of Meru County. The findings were used to refine the instruments to enable increased reliability for use in Giaki location. During the piloting, attention was focused on questions that may make respondents uncomfortable so as to reduce despondence exhaustion during the administration of the questionnaire.

3.5.2 Validity

There are different types of validity available for researchers to use they include; face validity, criterion validity, construct validity, Content validity and statistical conclusion validity among others. The study used statistical conclusion validity because is a degree to which conclusions about the relationship among variable as are reasonable. It involves ensuring the use of adequate sampling procedures Anastasi and Urbina (1997) the researcher tested the instruments before the real research was started in a process called research pre-test. Consultations with the supervisor on whether the instrument was valid were done and various amends on the tool was made at this stage. Questions that proved to be vague or ambiguous were deleted from the questionnaire. It is important to stress that findings which were obtained in the pre-testing study was not used in the final report but was vital for purposes of testing the research instruments.

3.5.3 Reliability of the instrument

Reliability can be defined as a consistency of one's measurement or the degree to which an instrument measures the same way each time if the instrument is used under the same conditions with the same subjects (Trochim, 2006). A measure is considered reliable if the person's score on the same test given twice is similar. Reliability of research instrument can be checked using a number of techniques which include; inter-rate reliability technique, test re-test technique, inter-method technique and internal consistency technique. In this study the reliability of the instruments was checked using the test-re-test technique because it's easier to administer and understand this technique refers to the test of consistency among different administrations to determine the coefficient for this type of reliability; the same questionnaire was given the sampled population of the farmers in Giaki location on at least two separate occasions. The questionnaire was given to the farmers on two weeks difference. The test was done on last week of April and Retest conducted in the second or third week of May. The questionnaires were expected to yield similar results. Then to find the test re-test reliability coefficient, correlation between the test and the re-test was calculated using the formulae for correlation coefficient below:

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Where

N is the total number of pairs of test and retest scores.

X is the total number of famers who took the test

Y is the total number of farmers who took the Re-test

r is the measure of liner relationship between X and Y

r was expected to range between (– 1) and (+1)

$$r = \frac{133 * 361 - 206 * 205}{\sqrt{\{133} * 368 - 42436\}\{133 * 363 - 42025\}}$$

$$\frac{5783}{6383.37} = \mathbf{0.9059}$$

According to test retest process the study found a correlation of 0.9059 which is strong correlation and hence the instrument of data correction was found to be reliable.

3.6 Data collection procedures

Before starting the process of data collection, this study proposal was taken through approval procedures as required by the University of Nairobi. The research assistants were trained for two days on correct interpretation of the questions in the instruments and ethical considerations. The researcher was in the field with the research assistants giving helping hand to both the research assistants and the respondents wherever necessary.

The research assistants interviewed individual farmers using structured questionnaires and respondents were assured of strict confidentiality. To ensure high response rate the farmers were interviewed in their farms during the days and also not be distracted them from attending to their farms. All completed questionnaires were collected every evening and daily meetings were held between the researcher and research assistant to review and evaluate the progress and address emerging issues

3.7 Data analysis techniques

Data analysis seeks to fulfill research objectives and provide answers to research questions. After the data was collected, it was edited and coded for analysis. Coding is assigning a code number to each answer to a survey question. Editing is checking the questionnaire to identify and eliminate errors made by the respondents. The responses in the questionnaire were then tabulated, coded and processed using statistical package for social science (SPSS). Descriptive statistics was used to analyze the responses. Tables and figures were used to present the data while frequencies (f) and percentages (%) were used to discuss the findings.

3.8 Ethical considerations

Information obtained from other sources or from other authors to support the relevance of this research is adequately acknowledged in the form of references. The researcher and assistants satisfactorily and clearly explained the purpose of the study to the respondents. Before commencing interviews with the respondent, the researcher asked for permission from the respondent to participate voluntarily in the study.

The researcher assured the respondents that the information provided by them will be treated with high confidentiality and will be used for the research purpose only. In conducting this study appropriate consideration was made to avoid plagiarism by ensuring that other people's works used in both the proposal and research report was fully acknowledged and proper citations documented

3.9 Operational definition of the variables

An operational definition of variables is a statement presented in form of a table that intends to describe how a particular variable is to be measured, how an objector condition is to be organized (Creswell 2008) .The purpose of this is to make the research concepts are measurable. The information is as in Table 3.1

Table 3.3 Operationalization of variables

Objectives	Variables	Indicators	Measure	Scale	Data analysis
To determine the influence of middlemen a market on marketing of sorghum produce.	Middlemen as Market Linker	--Middlemen --Exploitive --Better informed --key players in the market	--middlemen --profit ratio --Up to date information --Importance, Reliability	Nominal	Descriptive statistics
To examine the influence road infrastructure as market link on marketing of sorghum.	Road infrastructure	--Type of road --frequency of repairs --Distance to the market --road condition/reliability --convenience means of transport	--Murrumed, Bushy footpath, all weather roads. --kilometers, meters --faster, safer	Nominal	Descriptive statistics
To find out the influence of access to information on marketing of sorghum.	Access to information	--Mode of communication --Source of information --Type of information --Reliability of the information	--phones, email, letters, word of mouth --customers, middlemen, fellow farmers, government agency --market information, weather information, training information. -- up to date information, outdated information,	Nominal	Descriptive statistics
To examine the influence of price on marketing of sorghum.	Price	--Unit of measure --Price setters --Price variability	--Ksh, Dollars -- middlemen, farmers, government --seasons, famer to farmer.	Nominal	Descriptive statistics

		--Means of payment.	--Cash, cheque, mobile banking		
Agricultural marketing	Agricultural marketing	Supply seasons Variety Quantity Mode of transport	--Month of harvest -- type of sorghum --kgs --Bicycle, Cart, motor bike , pick-up	Nominal	Descriptive statistics

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter represents the findings of the study, which have been discussed in line with study objectives as per the questionnaire .The areas include: demographic Characteristics of respondents, general questions of sorghum farming, middlemen as market link and sorghum marketing, road infrastructure and sorghum marketing, access to market information and sorghum marketing, and price and sorghum marketing.

4.2. Questionnaire Return rate

A total of 138 questionnaires were distributed to the sorghum farmers' one per household to the resident of the 3 sub-locations in Giaki location. 133 questionnaires were collected and they were used for the analysis. This was 93.3% response rate. This high percentage of rate of return was influenced by the knowledge gotten in the field during pilot study. In the questionnaire all questions were answered. Amin (2005) recommends response rate which is higher than 65% and so the response rate of 93.3% in this study was accepted.

4.3 Demographic characteristics of the respondents

The information about demographic characteristics of the respondents was collected in relation to gender, age, how long the respondents has been involved in sorghum farming, and level of education of the respondents. The results are represented in the following sub-sections.

4.3.1 Gender of the respondents

The gender of the respondents is as summarized in Table 4.1.

Table 4.1 gender of the respondents

Gender	frequency	Percentage
Male	71	53.3
Female	62	46.7
Total	133	100

As shown on the table, male famers were the majority 71(53.3%) of the respondents while female famers were the minority 62(46.7 %).

4.3.2 Age of the respondents

The research asked about age of the respondents. This is because the younger generation may have advanced means of accessing marketing information and also the much older farmers maybe having relevant experience on sorghum marketing especially concerning middlemen and road infrastructure.

The age of respondents is summarized in Table 4.2

Table 4.2 Age bracket of the respondents

Age bracket	Frequency	Percentage
15-25 years	8	6
26- 35 years	36	27.1
36-45 years	43	32.3
46- 55 years	29	21.8
56 years and above	17	12.8
Total	133	100

As shown in the table. From the 133 famers 8(6%) were of age blanket of between 15-25, 6(27.1%) were between 26-35 years of age. Majority group of respondents 43(32.3) were between 36-25 years of age. 29(21.8%) were between 46-55 were aged 56 years and above were 17(12.8%).

4.3.3 Years involved in sorghum marketing.

This section of demographic questions is to find out the experience the respondents have in the field of sorghum produce in relation to its marketing.

Experience of sorghum marketing is summarized in Table 4.3

Table 4.3 Years of sorghum marketing

Years	Frequency	Percentage
Less than 5	20	15
6-10 years	43	32
11-15 years	40	30
16- Years and above	30	23
Total	133	100

As shown in Table 4.3 Those who had less than 5 years experience were minority 20(15%) the majority 43(32%) had 6-10 years of experience. Those between 11-15 years of experience were 40(30%) and those had 16 of experience and above were 30 (23 %).

4.3.4 Level of education

The study sought to find out the level of education as it is believed that those with higher level of education mostly have been shying away from agricultural activities though in resent past they have turn to agricultural activities as source of employment. Here in terms of education level the respondents were asked to indicate the level highest level of education attained.

The results are shown in Table 4.4.

Table 4.4 Level of education

Level of education	frequency	Percentage
Primary level	56	42
Secondary level	40	30
College level	27	20
University level	10	8
Total	133	100

As shown on Table 4.4 from the 133 respondents, majority of them 56(42) were of primary level of education. 40(30%) were of secondary level of education. College level were 27(20%) and minority 10(8%) were of University level of education.

4.4 General questions on Sorghum Marketing

In this section the study dealt with general questions concerning the sorghum produce.

4.4.1 Type of sorghum produce

In this section the study sought to find out the kind of sorghum produce the respondents deal with mostly. This is because when doing literature review it was found out that the sorghum farmers deal with either sorghum grains or stalks as fodder. So we wanted to find out what different famers deal with.

Type of sorghum produce a farmer Markets is shown on Table 4.5

Table 4.5 Type of sorghum produce

Type of produce	frequency	percentage
Grains	121	91
Stalks as fodder	0	0
Both	12	9
Total	133	100

As shown in Table 4.5 majority of respondents 121(91%) are dealing with grain produce, none of the respondents were dealing with stalks as fodder only and minority 12(9%) were dealing with both produce which are grains and stalks as fodder for animals.

4.4.2 Quantity of sorghum grains harvested

Quantity of sorghum marketed by famers is distributed in Table 4.6

Table 4.6 Quantity of sorghum grains marketed

Quantity	Frequency	Percentage
1-100	0	0
101-1000	108	81.2
Above 1000	25	18.8
Total	133	100

Table 4.6 shows that from the 133 respondents dealing with grains none of them sold less than 100 kgs a season. Majority of the respondents 108(81.2%) sold between 101-1000 kgs per season while minority 25(18.8%) of the respondents dealing with sorghum grains markets above 1000 kgs every season.

4.4.3 Variety of sorghum produces selling most

On Variety of sorghum selling most is presented in Table 4.7

Table 4.7 Variety of sorghum selling most

Variety	frequency	percentage
Sila	119	89.5
Gadam	14	10.5
Total	133	100

As shown in Table 4.7 Sila variety has majority 119(89.5 %) marketed Sila variety while minority 14(10.5) markets Gadam variety. This is because of many factors known by them.

4.4.5 Mode of transport

Information on the mode of transport available to respondents is presented in Table 4.8

Table 4.8 Mode of sorghum transport

Mode of transport	frequency	Percentage
Motorbike	33	24.8
Wheelbarrow	15	11.3
Cart	63	47.4
Pick-up	22	16.5
Total	133	100

As shown in Table 4.8, 33(24.8%) of the respondents use motorbike, minority 15(11.3%) use wheelbarrow, majority 63(47.4%) use cart to transport the produce, while 22 (16.5%) of the respondents use pick-ups as mode of transport for their sorghum produce to the customers.

4.5.6 Mode of sale

Some people sell individually while others sell as a group.

Table 4.9 lists the number of farmers selling individually and those selling as a group.

Table 4.9 Mode of sale

Response	Frequency	Percentage
Individually	133	100
Group	0	0
Total	133	133

As shown in Table 4.9 all the respondents sell their sorghum produce individually and no any formal group used in selling this produce.

4.5 Middlemen as market link

This study wanted to find out the motives respondents have towards middlemen as market link in the marketing of sorghum produce. This is because in the literature review it was found out that different authors have different opinions towards middlemen as market link.

4.5.1 Use of middlemen in marketing their produce

Table 4.10 represents the information on if the famers use middlemen in marketing their sorghum produce or not.

Table 4.10 Involvement of middlemen in marketing

Response	Frequency	Percentage
Yes	119	89.5
No	14	10.5
Total	133	100

As shown in Table 4.10 majority of the respondents with 119(89.5%) uses middlemen to get their produce to the customers or market. Minority 14(10.5%) of the respondents don't involve middlemen to sell their produce to the customers.

4.5.2 Profitability

On whether selling to middlemen is profitable to famers than selling direct to the consumers or manufactures is shown in Table 4.11

Table 4.11 profitability

Response	Frequency	Percentage
Agree	18	13.5
Disagree	115	86.5
Total	133	100

Table 4.11 shows that minority of the respondents 18(13.5%) of the respondents thought that middlemen involvement to sorghum marketing in more profitable to farmers than selling to customers direct. While majority 115(86.5%) of the respondents disagreed that selling to middlemen is more profitable to famers than selling direct to customers in the market.

4.5.3 Middlemen convenience as link to marketing

On whether middlemen as market link were convenience is summarized on Table 4.12

Table 4.12 Middlemen convenience

Response	Frequency	Percentage
Disagree	16	12
Agree	107	80.5
I don't know	10	7.5
Total	133	100

As shown on Table 4.12 ,16(12%) of the respondents disagreed to the statement that middlemen provide the most convenience link of marketing sorghum, majority 107(80.5%) of the respondents agreed with the statement while minority 10(7.5%) of the respondents indicated that they don't know if middlemen provide the most convenience means of sorghum marketing.

4.5.4 Middlemen informality

On whether middlemen are better informed than famers on sorghum marketing issues is summarized in Table 4.13

Table 4.13 Are middlemen better informed than sorghum farmers

Response	Frequency	Percentage
Yes	124	93.2
No	9	6.8
Total	133	100

As shown in Table 4.13 majority of the respondents 124(93.2%) viewed middlemen to be better informed than sorghum producers, while minority 9(6.8%) indicated that middlemen are not better informed than sorghum producers.

4.5.5 Middlemen exploitive

The information on whether middlemen are exploitive to famers is presented in Table 4.14

Table 4.14 Are middlemen exploitive to sorghum farmers?

Response	Frequency	Percentage
Yes	128	96.2
No	5	3.8
Total	133	100

As per Table 4.14 majority 128(96.2%) of the respondents indicated that middlemen are exploitive while minority 5(3.8 %) indicated that middlemen are not exploitive to farmers.

4.5.6 Importance of middlemen as market link

On whether middlemen are important as market link is summarized in Table 4.15

Table 4.15 Importance of middlemen

Response	Frequency	Percentage
Yes	92	69.2
No	41	30.8
Total	133	100

As shown in Table 4.15 majority of the respondents 92(69.2%) felt that middlemen are important in marketing of sorghum because they reduce cost of transportation of the produce since they pick it from farm gates and also they are conversant with new or emerging markets while minority 41(30.8%) felt that middlemen are not important in marketing of sorghum produce with reason being that they sometimes buy sorghum at a lower price compared with the cost of production hence the famer getting minimal profit from his/her produce.

4.6 Road infrastructure and sorghum marketing

Giaki location is vast in terms of geographical mapping and hence it is expected to have different kind road infrastructure in the three sub location. In this section the study wanted to find out the influence road infrastructure has in relation to sorghum marketing in Giaki location of Meru County.

4.6.1 kind of road infrastructure

On the kind of road infrastructure available for the respondents to use while marketing their sorghum produce is shown in Table 4.16

Table 4.16 Kind of road infrastructure

Kind of road	Frequency	Percentage
Murramed	47	35.3
Tarmacked	0	0
All weather roads	16	12.1
Bushy/Dusty terrains	70	52.6
Total	133	100

As shown in Table 4.16, 47(35.3%) of the respondents used Murramed kind of road, none of the respondents had an access or used tarmacked road. Minority 16(12.1%) used all weather roads and the majority of the respondents 70(52.6%) used Bush/Dusty terrains while marketing their sorghum produce.

4.6.2 Frequency of road reappearance

On the interval/interval when the roads in Giaki location are repaired is shown in Table 4.17

Table 4.17 Frequency of road reappearance

Period	Frequency	percentage
Annually	37	27.8
Quarterly	0	0
After two years	96	72.2
Total	133	100

As shown in Table 4.17 the roads are repaired ether annually or on two year basis. This is because minority of the respondents 37(27.8%) indicated that the kind of road infrastructure they use is repaired after every year while majority 96(72.2%) of the respondents indicated that the road they use is repaired after every two years.

4.6.3 Suitability of kind of road infrastructure used by the respondents.

On suitability of available road infrastructure is summarized in Table 4.18

Table 4.18 Suitability of kind of road infrastructure

Response	Frequency	Percentage
Completely Agree	0	0
Agree	45	33.8
Completely Dis-agree	73	54.9
Dis-agree	15	11.3
Total	133	100

As in Table 4.18 45(33.8%) of the respondents agreed that the kind of road infrastructure available for them is suitable. Majority of the respondents 73(54.9%) completely disagreed that the kind of road infrastructure available for them is suitable while minority 15(11.3%) of the respondents disagreed that the kind of road infrastructure available for them in marketing their sorghum produce is suitable.

4.6.4 Condition of road infrastructure

On the current condition of road infrastructure in Giaki location is summarized in Table 4.19

Table 4.19 Current road infrastructure condition

Road condition	Frequency	Percentage
Worse	10	7.5
Poor	73	54.9
Good	50	37.6
Better	0	0
Total	133	100

As shown in Table 4.19 minority of respondents 10(7.5%) felt that the current road infrastructure was in worse condition, while majority 73(54.9%) felt that the condition of road was poor. 50(37.6%) of the respondents felt that the current road condition they use for marketing sorghum produce was good while no respondents felt the road condition was better.

4.6.5 Effect of current road infrastructure on sorghum marketing

The effect of current road infrastructure on marketing of sorghum produce is shown in Table 4.20

Table 4.20 Effect of current road infrastructure

Effect	Frequency	Percentage
Negative	83	62.4
Positive	50	37.6
Total	133	100

As shown by Table 4.20 majority of the respondents 83(62.4%) felt that the current road condition in the location had a negative effect on the marketing of sorghum produce while minority of the respondents 50(37.6%) felt that the current road condition had a positive effect on marketing of their sorghum produce.

4.6.6 Improvement on road condition and increase in income from sorghum marketing

On whether improved condition of road infrastructure can in turn improve the income coming from sorghum produce is presented in Table 4.21

Table 4.21 Income from sorghum produce can increase due to improved road condition

Response	Frequency	Percentage
Dis-agree	23	17.3
Agree	80	60.2
I don't know	30	22.5
Total	133	100

As shown in Table 4.21 minority of the respondents 23(17.3%) disagreed with the statement, majority 80(60.2%) agreed with the statement while 30(22.5%) of the respondent didn't know if there will be any improvement on the income from sorghum marketing when the road condition is improved.

4.7 Access to information and Sorghum marketing

This part of the questionnaire of this study wanted to find out the influence some aspect of access information have on marketing of sorghum produce in Giaki location; this is because information is power mainly in the marketing field.

4.7.1 Mode of accessing information.

Table 4.22 will be used to summarize the information on mode of accessing marketing information used by the respondents

Table 4.22 Mode of accessing information

Mode	Frequency	Percentage
Word of mouth	37	27.8
Radio/TV	0	0
Mobile phones	96	72.2
Newspapers/emails	0	0
Total	133	100

As shown by Table 4.22, minority of the respondents 37(27.8%) use word of mouth to access information while majority 96(72.2%) of the respondents use mobile phones to access information on marketing of sorghum produce.

4.7.2 Reliability of mode of getting information

On whether the mode of accessing information by the respondents was reliable it is summarized in Table 4.23

Table 4.23 Reliability of mode of accessing information

Response	Frequency	Percentage
Yes	103	77.4
No	30	22.6
Total	133	100

As in Table 4.23, majority of respondents 103(77.4%) felt that the mode of accessing information on Table 4.22 is reliable while minority or respondents 30(22.6%) felt that the mode they used assessing information is not reliable.

4.7.3 Source of information

On the source of information Table 4.24 is used to present the information.

Table 4.24 Sources of information

Source	Frequency	Percentage
Government Agency	0	0
Middlemen	89	66.9
Fellow farmers	30	22.6
Customers	14	10.5
Total	133	100

As shown by Table 4.24 majority of the respondents 89(66.9%) receive information from middlemen, 30(22.6%) of the respondents gets information from fellow farmers while minority 14(10.5%) of the respondents gets information direct from the consumers.

4.7.4 Kind of information gotten from the source

On the kind of information gotten from the source of information in table 4.24 is summarized in table 4.25

Table 4.25 Kind of information

Kind of information	Frequency	Percentage
Marketing	63	47.4
Price	51	38.3
Weather	0	0
Other information	19	14.3
Total	133	100

As shown in Table 4.25 majority of respondents 63(47.4%) get marketing information, 51(38.3%) of the respondents receive information concerning price, while minority of the respondents 19(14.3%) of the respondents receive other kind of information from the source.

4.7.5 Effect of improved access to information

On whether improved access to information as positive effect on sorghum marketing is summarized on Table 4.26

Table 4.26 improvement in access to information

Views	Frequency	percentage
Yes	133	100
No	0	0
Total	133	100

As shown in table 4.26 all respondents 133(100%) felt that an improvement in information access to the famers it will influence the marketing of sorghum produce in a positive way.

4.8 Price and sorghum marketing

Profitability depends mostly on the price of the produce. Sorghum price can be higher or low but weather there is profit is what is important. In this section the study wanted to find out issues dealing with price factor.

4.8.1 What units are used?

On the unit of measure used by famers in Giaki location while marketing their sorghum produce is presented in Table 4.26

Table 4.27 Unit of measure

Unit of measure	Frequency	Percentage
Ksh	133	100
Dollars	0	0
Total	133	100

As shown in Table 4.27 All the respondents use Kenyan currency to while marketing their produce.

4.8.2 Sorghum price setters/determiners

On who sets or determines the prices of sorghum produce Table 4.28 was used to summarize the information.

Table 4.28 Sorghum price setters

Price setters	Frequency	Percentage
Farmer	31	23.3
Government	0	0
Middlemen	88	66.2
Consumer	14	10.5
Total	133	100

As in Table 4.28, 31(23.3%) of the respondents indicated that the farmers set the prices of the sorghum produce while selling, majority 88(66.2%) of the respondents indicated that its middlemen who sets the price at which they buy sorghum produce with from the famers. While minority of respondents 14(10.5%) indicated that its consumers who determine the prices of the sorghum produce.

4.8.2 Sorghum price variability

On the issue of whether the prices of sorghum produce varies from season to season, farmer to farmer or middlemen to middlemen is presented or are fixed is presented in Table 4.29

Table 4.29 Sorghum price variability

Response	Frequency	Percentage
Yes	133	100
No	0	0
Total	133	100

As shown by Table 4.29 All respondents 133(100%) indicated that the prices keep on changing.

4.8.3 Mode of payment

On the means of payment Table 4.30 was used to summarize the information.

Table 4.30 Means of payment

Mode of payment	Frequency	Frequency
By Cheque	7	5.3
Cash	52	39.1
Mobile banking	74	55.6
Total	133	100

As per Table 4.30 minority of the respondents 7(5.3%) get paid through cheque. 52(39.1%) of the respondents get paid through cash transfer while majority 74(55.6%) of the respondents use different means of mobile money transfer as means of payment for their sorghum produce.

4.8.4. Price of sorghum in different years

On the prices of sorghum as per different years is summarized in table 4.31

Table 4.31 price of sorghum indifferent years

Year	price range in Ksh
2015	28-33 ksh
2016	30—35 ksh
2017	30—35 ksh

As seen in Table 4.31 All the respondents indicated that in the year 2015 they sold their sorghum produce between 28-33 ksh, in 2016 they sold the sorghum produce in between 30-35 Ksh. And this year 2017 just like year 2016 they have been selling their sorghum produce at a price between 30-35 ksh.

4.8.5 Price on quantity of sorghum marketed

On whether prices increase in turn increases the quantity of sorghum produce marketed is analyzed in Table 4.32

Table 4.32 effect of price on quantity of sorghum marketed

Response	Frequency	Percentage
Yes	115	86
No	18	14
Total	133	100

As shown by Table 4.32 115(86%) of the respondents agreed that increase in price in turn leads to increase in sorghum produce marketed per season and vice versa. 18(14%) of the respondents felt that even if the prices are increased the supply may not increase in the market.

4.8.6 Take on current sorghum price.

On whether the current price of sorghum produce in sufficient to the famers or produces is summarized in Table 4.33

Table 4.33 Take on current sorghum price

Response	Frequency	Percentage
Yes	14	10.5
No	119	89.5
Total	133	100

As shown in Table 4.33 on answering the question that" are you happy with the current sorghum price, minority of the respondents 14(10.5%) indicate YES they are happy while majority of the respondents 119(89.5%) indicated NO.

4.9 Correlation analysis

The relationship between the variables is summarized in Table 4.34

Table 4.34 Correlation Matrix

		Sorghum marketing	Middlemen as market link	Road infrastructure	Access to information	Price
Sorghum marketing	Peason correlation	1				
	sig (2-tailed)					
Middlemen as market link	Peason correlation	0.51	1			
	sig (2-tailed)	0.029				
Road infrastructure	Peason correlation	0.390	0.420	1		
	sig (2-tailed)	0.049	0.099			
Access to information	Peason correlation	0.679	0.561	0.662	1	
	sig (2-tailed)	0.019	0.600	0.561		
Price	Peason correlation	0.536	0.457	0.395	0.310	1
	sig (2-tailed)	0.030	0.012	0.010	0.041	

As shown on Table 4.34 Peason's product moment coefficient analysis (PPMC) was used to test the strength of the association between the variables. The researcher used the Peason's product moment correlation and the findings were as on the table. From the findings it was clear that there was a positive correlation between sorghum marketing and middlemen as market link as indicated in correlation figure 0.51. It was also clear that there is a weak positive correlation between sorghum marketing and road infrastructure as the correlation

figure was 0.39. Also there was a strong positive correlation between sorghum marketing and access to information as the correlation was found to be 0.679.it was also revealed that there is a positive correlation between price and sorghum marketing as the correlating figure was found to be 0.536. Finally it was established that there was a strong positive correlation between Access to information followed by price and middlemen respectively while road infrastructure had the weakest association with sorghum marketing .moreover all the variables were significant at 95% confidence level with sorghum marketing, access to information being the most significant (P=0.019) and road infrastructure being least significant (P=0.048)

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introductions

This chapter contains the summary of the findings, discussions, conclusions and recommendations together with suggestions for further research.

5.2 Summary of findings

The objectives of this study were to examine the influence of middlemen as market link on marketing of sorghum produce, to find out the influence of road infrastructure on marketing of sorghum produce, to determine the influence of access to information by farmers on marketing of sorghum produce, and to assess the influence of prices on the marketing of Sorghum in Giaki Location.

In this research study a total of 133 respondents were available for the study, where out of them 71(53.3%) where male while 62(46.7%) were female. It was also found that majority of the respondents 43(32.3%) were of age 36-45 years and closely followed by those of 26-35 years old 36(27.1%). 91 % of the respondents markets sorghum grains . 108(81.2%) markets about 101-1000 kgs of grains every season. It was found out that most of the grains marketed 119(89.5 %) were of Sila variety.

On the influence of middlemen as market link the study found out 119(89.5%) of the respondents use middlemen as market link to market their sorghum. 18(13.5%) of the respondents agreed that selling to the middlemen is profitable while 115(86.5%) of the respondents disagreed that selling to middlemen is more profitable to famers than selling direct to the consumes. 107(80.5%) agreed to the statement that middlemen provide the most convenience means of marketing sorghum grains 16(12%) disagreed to the statement while 10(7.5%) didn't know. The study also found out that 124(93.2%) of the respondents agreed to the statement that middlemen are better informed about sorghum marketing then the famers while 9(6.8%) of the respondents said no to the statement. Majority of the respondents 128(96.2%) confirmed that middlemen are exploitive to farmers while 5(3.8%) thought that they are not. Also the study found out that majority of the respondents 92(69.2%) thought that middlemen are important in marketing of sorghum produce because they reduce the transportation cost to the customers because they buy at farm gates and also they are

conversant with new or emerging markets while 30.8 % of the respondents thought that they are not important only because at times they buy sorghum at lower price compared to the cost of production hence leaving the famers with minimal profits.

Regarding the influence of road infrastructure on marketing of sorghum produce the study found out that 70(52.6%) of the respondents use dusty terrains wile transporting their sorghum 47(35.3%) use murrumed roads while 16(12.1%) use all weather roads. The study found that majority of the roads is repaired on two year basis. 73(54.9%) of the respondents strongly disagreed to the statement that the kind of road infrastructure available for them is appropriate for marketing of their sorghum produce, 45(33.8%) agreed to the statement while 15(11.3%) only disagreed to the statement. According to Majority of the respondents 73(54.9%) roads were currently in poor condition. The poor condition of the roads affects sorghum marketing negatively this is according to 83(62.4%) of the respondents. 80(60.2%) of the respondents agreed that improvement on road infrastructure will in turn improve the income gotten from sorghum marketing.

In regard to influence of access to information on sorghum marketing the study found out that 96(72.2%) of the respondent use mobile phones to access information while 37(27.8%) use word of mouth to access information. 103(77.4%) of the respondents felt that the mode of accessing information was reliable to them while 30(22.6%) thought the mode was not reliable. It was found out that larger portion of respondents 89(66.9%) gets the information from middlemen, 30(22.6%) gets information from fellow farmers while 14(10.5%) of the respondents gets information from customers. Most of the information gotten from the source of information was marketing information according to 63(47.4%) of the respondents, 51(38.3%) of the respondents gets pricing information and 19(14.3%) of the respondents gets other type of information. All the 133(100%) respondents felt that if an improvement is done in the access to information sector it will have a positive impact to the marketing of sorghum produce in Giaki location. This is because when people are informed they are equally empowered.

On objective four on the influence of price on marketing of sorghum the study found out that all the 133 respondents use Kenyan currency as currency of measure. A larger portion of the respondents 88(66.2%) indicated that middlemen are the one who sets the prices of the sorghum produce, 31(23.3%) indicated that it's the famers who set the price while 14(10.5%) states that the consumers sets the price of the sorghum. The study also found out that majority

of respondents 74(55.6%) gets paid though mobile money banking means, 52(39.1%) are paid through cash transaction while 7(5.3%) of the respondents are paid through cheque. It was also found out that from 2015 to first season of 2017 the prices of sorghum grains per kilogram has been ranging between 28-35 ksh. 14(10.5%) of the respondents are happy with the current sorghum price while the majority of respondents 119(89.5%) of the respondents were not happy with the current price of the sorghum produce. 115 (86%) of the respondents felt that when the prices of sorghum grains are increased they in turn lead to increase in the sorghum produce marketed per season. Majority of the respondents recommended that the government should intervene on the pricing of the sorghum produce and sets prices which will favor both the famer and the middlemen and not only the middlemen who exploit the famers in terms of prices.

5.3 Discussions of the finding

In relation to the demographic information of the respondents that majority of the respondents were of 25-45 years of age. This is in agreement with Okwoche (2012) where it argued that marketing of sorghum is dominated by youthful males who are mainly energetic enough to with stand the stress involved in the business.

On middlemen as market link 119(89.5%) of the respondents indicated that they use middlemen to link with the market outside. Despite of them dealing using middlemen as market link 115(86.5%) of the respondents felt that selling to middlemen is not as profitable as selling direct to the manufacturers or consumers. 124(93.2%) of the respondents felt that middlemen are better informed than famers/producers. Also bigger portion of the respondents 128(96.2 %) felt that middlemen are exploitive to farmers. This is in agreement with Thapa and Porkhrel (2007) that mainly middlemen by using their monopsonistic position and low bargaining power and lack of enough information of famers/producers they are thought to be taking advantage of famers by offering those prices far below the market value. This is because the famers are not informed about the current market prices or even though they are informed they cannot reach the larger markets. Despite the negative views of middlemen large number of respondents 92(69.2%) thought that middlemen are important in the marketing of sorghum produce only if they are not dishonest to the famers/produces. This is in agreement with Jones (1984) when studying potato farming and marketing in Blovian. He argued that the role of middlemen had positive impact on producers and should be taken into consideration when policy for rural development is being set. He also added that if indeed middlemen are not exploiting producers they can be argued to provide valuable services such

as transportation of goods and market access that other actors are either unable or unwilling to provide.

In relation to road infrastructure and marketing of sorghum it was revealed that many roads are of dusty terrains 70(52.6%) conforming that they use dusty terrains for transportation. 73(54.9%) felt that the current road infrastructure is not appropriate. And 73(54.9%) felt that the road condition was poor. The poor condition of the road infrastructure is assumed to be mainly because Giaki location is of remote area of Meru County where road infrastructural development is slow just like other remote areas in developing countries. This comes in agreement with Ogusanya (1988) on relationship between transportation, under development and rurality he observed that the greater the degree of rurality, the lower the level of road transport development. 83(62.4%) of the respondents felt that the current road condition has negative effect on marketing of sorghum produce. 80(60.2%) of respondents indicated that improvement on the current road condition will in turn improve the profits margin of sorghum famers/producers. This is because when the roads are in poor condition the manufacturers and other buyers fear or are not able to come to the remote areas to buy sorghum to the famers and also farmers find it difficult to travel to the larger market center to sell their produce. This leaves the middlemen as the only reliable option for the rural small scale famers to market their sorghum produce hence low profitability to famers. If the road condition was improved the manufacturers would be able to come to the village to buy the sorghum produce and also the famers would be able to transport their sorghum produce to the bigger market hence gaining maximum profit margin with avoidance of exploitive middlemen. This is in agreement with Raisuddine and Hossain (1990) that improvement of feeder roads, bridge construction and rural roads routine and spot maintenance results in increased participation of vendors at local markets, increased variety of available agricultural products and the geographic size of markets.

On relation to access to information it was revealed that 96(72.2%) used mobile phones as means of access to information. This is contrary to Kindness (2001) who argued that mostly the famers get information from fellow famers though word of mouth. This difference is mainly because of late mobile phone technology has developed and they have become cheap to be affordable by everybody. 103(77.4%) of respondents felt mobile phones were reliable as mode of accessing information. This comes in agreement with Donovan (2011) who argues that mobile phones help to increase income, improve efficiency of marketing, reduces transaction cost and provide faster and effective information transmission among farmers.

89(66.9%) gets information from the middlemen. This mainly is because the middlemen have an outside exposure than the famers giving them an upper hand when it comes to first hard information. This makes the famers/produces to relay on middlemen as major source of information. All the respondents felt that if improvement is done on the access to information sector there will be a positive effect of the marketing of sorghum produce. This is because when the famers or producers get information empowerment they will be able to make beneficial decisions in the marketing field.

On the influence of price on sorghum marketing it was revealed that 74(55.6%) of the respondents get paid through mobile phone money transfer. While 52(39.1%) get paid on cash means of payment. This high usage of mobile money transfer is assumed to be because of new innovations in the mobile phones sector with introduction of many mobile services for example Mpesa, Airtel money, and Mobicash among others. The prices of sorghum produce were noticed to be fluctuating in a period of between years 2015 to 2017 in our case study. This period was equal to five sorghum harvest seasons. The prices were ranging between 28-35ksh. This is with agreement with Chemonic (2010) where he argues that the sorghum prices are unstable. This was according to the data gotten also from Kenya ministry of Agricultural Department. 119(89.5%) of the respondents were not happy with the current prices of sorghum produce. 115(86%) felt increase in prices of sorghum produce will in turn lead to increase in sorghum produce marketed. This is because some of the famers opt to keep the produce for home consumption when the prices are low. 18(14%) felt that even if the prices are increased the supply of marketed produce will not increase. They argued that famers cannot offer what they don't have, meaning that if the harvest is low then not even the prices can affect the supply. Majority of the respondents urge the government to intervene and help in setting a fix market price for sorghum produce.

5.4 Conclusions

From the study it can be concluded that most of the respondents dealing with sorghum marketing are in their youthful years and are mostly males. The results indicated that majority of the respondents have been involved in sorghum marketing for a period of not less than 6 years. It was also clear that most of them are of primary level of education.

From the results it's noted that most marketed sorghum produce was grain produce which is harvested twice a year. The results indicates that none of the respondents harvested less than 100 kgs of sorghum grains this shows that sorghum production is good in Giaki location. Sila

variety is the most produced and marketed since it is preferred by most manufacturing companies. The study also revealed that most of the respondents use cart as means of transport.

The results also reviewed that majority of the respondents use middlemen to market their sorghum produce though it's not profitable selling to middlemen as they would wish. It was also reviewed that they sell to middlemen because it's the most convenient means available for them; this is according to majority of respondents. The respondents use middlemen as market link because they assume that middlemen are better informed than them. The results also shown that despite the respondents dealing with middlemen as market link they view middlemen as exploitive. Even though the respondents viewed middlemen as exploitive towards them, majority of them also think that middlemen are important as market link. This is because middlemen have resources to transport sorghum produce in bulk and also they create connection between manufacturers and famers in the village.

With regard to road infrastructure the study reviewed that many of the respondents use dusty terrains as means of transporting their sorghum produce which in turn tends to be difficult and expensive to the small-scale farmers and hence opting to involve middlemen. It was also found out that despite these roads being so important to the villages or famers they are only serviced after two or more years. In the study it was noted that the current road infrastructure in Giaki location is in poor condition and brings negative effect in sorghum marketing. The respondents thought that if road infrastructure can be improved even the income coming from sorghum marketing can improve.

With regard to access to information it was noted that most of the respondents use mobile phones to access information from marketing parties mostly middlemen, this is according to majority of the respondents. The reason being the respondents find mobile phones being reliable and accessible to many people. It's also seen that improvement in access to information will also have a positive impact on sorghum marketing.

These results revealed that middlemen are the great determinants or setters of sorghum prices in Giaki location and despite the producers being the most important party in sorghum produce they have the least say in the determination of prices. The results also found out that the prices of sorghum grains vary from one season to the other though not so much. Its important for the prices to be increased in the market so as the famers or producers can increase the supply of sorghum produce to the market. This is according to majority of the

respondents. It was reviewed that majority of the respondents are paid through mobile phone money transfer. This shows how important the mobile phone technological sector has become when it comes to information access and money transaction.

5.5 Recommendations

Based on the findings and conclusions the study makes the following recommendations.

1. There is a need for sorghum producers to be empowered in terms of access to marketing information. Especially on the information involving prices and market availability for their produce. This will help to reduce or eliminate middlemen who are exploitive to the sorghum producers since the producers will have bargaining power.

2. There is also a need for the necessary institution to improve the road infrastructure in Giaki location if the famers are to benefit from sorghum marketing. This is because many farmers are unable to transport their produce to the manufactures or larger market using the dusty terrains during rainy seasons; hence middlemen take advantage of the situation since they have the resources and financial muscle to transport the produce to the manufacturers and other markets. If the roads are maintained and their conditions improved a large group of sorghum producers will be able to reach the larger market for their produce.

3. There is also need for the government agencies who are involved in price setting of agricultural produce to intervene towards the price setting of sorghum grains as recommend by many respondents. This is because respondents feel that middlemen being the ones who sets the price for the sorghum grains they set prices which only favors them and hence gaining more profits at the expense of producers (small scale farmers).

5.6 Suggestions for further research

Despite findings by this study, there are some more areas which need to be studied in relation to sorghum marketing. The study suggests some of these areas.

1. The study recommend that further studies should be carried out on other factors which influence marketing of agricultural produce among small scale farmers such as; Market infrastructure, Competition and technology.
2. Also similar research can be carried out in a different area dealing with sorghum production. And establish on these factors which influence marketing of agricultural produce a case of sorghum.

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APPENDICIS

Appendix I Letter of Transmittal

KOOME DENNIS KARANI

P.O BOX 404

MERU

20th APRIL 2017

Dear respondents

RE: REQUEST TO FILL QUESTIONAIRE

I am a student undertaking Masters of Arts Degree in project planning and management at the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education. I am currently carrying out a study on factors that influence marketing of sorghum produce among small scale farmers in Giaki location of Meru County.

This is therefore the purpose of this letter is to humbly request you to kindly provide me with information by completing the attached questionnaire since you have been selected to participate in this study. Your contribution is crucial and will ensure the success of this study. Any information provided will be treated with utmost confidentiality and will only be used for academic purpose only.

Your assistance and cooperation is highly appreciated.

Yours Sincerely

……..

Koome Dennis Karani

Appendix II Questionnaires

Instructions

Kindly answer the following questions as honest as possible.

Section A; Demographic questions

1. **Indicate your gender**

   Male ☐ Female ☐

2. **Age bracket**

   14—25 years ☐ 26—35 years ☐

   36—45 years ☐ 46—55 years ☐

   Over 55 years ☐

3. **For how long have you been involved in sorghum farming?**

   1-- 5 Years ☐ 6—10 years ☐

   11—15 years ☐ Above 15 years ☐

4. **Level of education**

   Primary level ☐ secondary level ☐

   College level ☐ University level ☐

Section B: General questions on Sorghum marketing

This section focuses on questions about sorghum produce and their marketing

5. **Which month is sorghum produce harvested?**

January	☐	February	☐	March	☐
April	☐	June	☐	July	☐
August	☐	September	☐	October	☐
November	☐	December	☐		

6. **What type of sorghum produce do you deal with?**

Grains ☐ Stalks as fodder ☐

Both ☐

7. **If grains in (6) above, how many Kgs of sorghum do you sell per season?**

Less than 100 ☐ from 101—1000 ☐

Above 1001 ☐

8. **Which variety of sorghum sells most?**

Gadam ☐ others specify ☐

Sila ☐

9. **What is the mode of transport for your produce to the market?**

Bicycle ☐ wheelbarrow ☐

Cart ☐ Pick up ☐

10. **Do you sell individually or as a group?**

Individually ☐ Group ☐

Section C Middlemen in the market and sorghum marketing

This part of the questionnaire deals with market link and marketing of sorghum produce. The section deals with motives that might apply when you sell through middlemen.

11. **Do you use middlemen to sell your produce to the customers in the market?**

Yes ☐ No ☐

12. **Selling to middlemen is profitable to farmers than selling direct to the customer.**

Agree ☐ Dis agree ☐

13. **Support your answer in (13)above ……**

……

14. **Middlemen provide the most convenience link for selling sorghum produce.**

Disagree ☐ Agree ☐

I don't know ☐

15. **Are middlemen better informed on marketing of sorghum produce than sorghum farmers?**

Yes ☐ No ☐

16. **Do you think middlemen exploit farmers?**

Yes ☐ No ☐

17. **Give one reason to support your answer in (16) above.**

……

……

18. **Middlemen as market link are important in marketing of sorghum produce**

Yes ☐ No ☐

19. **Give reasons to your answer in (18)**

……..

……..

Section D Road infrastructure and sorghum marketing

This section deals with influence of road infrastructure in sorghum marketing

20. **What kind of road infrastructure do you use to transport sorghum produce?**

Murramed ☐ Tarmacked ☐

All weather Roads ☐ Bushy/Dusty terrains ☐

21. **How often is road you use to transport sorghum produce repaired?**

Annually ☐ After Two years ☐

Quarterly ☐

22. **Kind of road you use as means of transport for sorghum grains is suitable**

Completely Disagree ☐ Dis-agree ☐

Agree ☐ Completely Agree ☐

23. **What is the current condition of road infrastructure you use to transport sorghum produce?**

Worse condition ☐ Poor condition ☐

Good condition ☐ Better condition ☐

24. **The condition of road infrastructure doesn't affect marketing of sorghum produce.**

Completely Disagree ☐ Dis-agree ☐

Agree ☐ Completely Agree ☐

I don't know ☐

25. **How does the current condition of road infrastructure affect marketing of sorghum produce?**

Negatively ☐ positively ☐

26. **Support your answer in (25) above ……**
.....

27. **Income from sorghum can be increased by improving the road condition in Giaki Location**

Dis-agree ☐ Agree ☐

I don't know ☐

Section E Access to market information and sorghum marketing

Information is power. This part of questionnaire deals with aspects of acquiring marketing information.

28. **How do you get information on where to sell your sorghum produce?**

Word of mouth ☐ Radio/TV stations ☐

Mobile phones ☐ Newspapers/Emails ☐

29. **Is the means of getting information mentioned in (28) above Reliable?**

Yes ☐ No ☐

If yes/no give the reason

……

……..

30. **Where do you get the information from?**

Government agency ☐ Middlemen ☐

Fellow farmer's ☐ Consumers ☐

31. **What kind of information do you get from (30) above?**

Marketing information ☐ Price information ☐

Weather information ☐ Other information ☐

32. **Good access to information can improve sorghum marketing process in a positive manner.**

Yes ☐ No ☐

Section F price and sorghum marketing

Sorghum price can be higher or low, but whether there is profit or not is what is most important. In this section of questionnaire is to find out about this issue.

33. **What units do you sell sorghum grains?**

Ksh ☐ Dollars ☐

34. **Who determines/sets the sorghum price?**

Farmer ☐ Middlemen/brokers ☐

Government ☐

35. **Does the sorghum price keep on changing?**

Yes ☐ No ☐

36. **Do price of sorghum produce differ with the variety?**

Yes ☐ No ☐

37. **How are you paid?**

By cheque ☐ Cash ☐

Mobile money transfer ☐

38. **At what price did you sell you sorghum produce during the following years?**

2014 ☐ 2015 ☐

20016 ☐ 2017 ☐

39. **Are you happy with current sorghum price?**

Yes ☐ No ☐

40 Does increase in prices lead to increase in sorghum produce marketed?

Yes ☐ No ☐

Support your answer …….

……..

41 What is your recommendation on the pricing of sorghum produce?

…….

…….