

**AN ANALYSIS OF MARKET INFORMATION SERVICES EFFICACY IN  
MAIZE PRODUCTION AND MARKETING SUB-SECTOR: THE CASE OF  
KONGWA DISTRICT, DODOMA REGION.**

**BY  
KAJIRU KISENGE**

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
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## ABSTRACT

The study assessed the relevance of the current agricultural market information available to farmers for purpose of increasing their efficiency and effectiveness in agricultural commodity market exchange, and establishes farmers' willingness and ability to access better information from a mix of alternative sources. Specifically the study objectives were: (i) to assess the type of market information needed by farmers (ii) to identify sources of information used by farmers, (iii) to assess the type and frequency of delivering the preferred market information, (iv) to establish farmer's willingness to pay for market information. A simple random sampling technique was employed to select 280 farmers. Qualitative analyses performed included computation of frequencies and cross tabulation. Quantitative analyses involved logistic regression. The study found that, 90.4% of households have access to information on where to sell and market selling prices than other types of information such as weather, credit, sources of inputs, and sources of agricultural equipments. Friends and neighbors, radio, local financial institutions were found to be the most important sources of information for farmers. Despite the fact that farmers have full knowledge of prices, the majority of farmers 91.5%, sell their maize immediately after harvestings when prices are lowest. Regression results show that education of the respondent and farm size owned by the respondents had significant and positive influence on Willingness-to-Pay ( $p < 0.01$ ) for information. While age and amount of money the farmer is willing to pay has a negative sign and insignificant in its relationship with Willingness-to-Pay for market information. Based on the study findings, it is recommended that market information access will be improved by localization of market information, improving means of delivering

market information, promoting market information needs and improving institutional and organizational arrangements.

## DECLARATION

I, KAJIRU FRANCIS KISENGE, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and has never been submitted nor concurrently being submitted for any degree award in any other University.



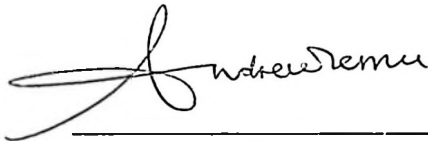
KAJIRU FRANCIS KISENGE

MSc. Agriculture Economics

26/10/2007

Date

The above declaration is confirmed



PROF. TEMU, A.E

Supervisor

26/10/2007

Date

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This work is dedicated to my beloved parents the late Mr. Nyelwa Kisenge and Mrs. Amina H. Kisenge who laid the foundation of my education as well as to my son Fredrick.

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## LIST OF ABBREVIATIONS AND SYMBOLS

MDB	=	Market Development Bureau
MCM	=	Ministry of Cooperative and Marketing
MLD	=	Ministry of Livestock Development
Fob	=	Free on board
KACE	=	Kenya Agriculture Commodity Exchange
KMDP	=	Kenya Marketing Development Programme
MIS	=	Market Information Services
Ksh	=	Kenya Shilling
Kg	=	Kilogram
US\$	=	United States Dollar
MT	=	Metric tones
IITA	=	International Institute for Tropical Agriculture
MIU	=	Market Information Unit
AIS	=	Agricultural Information Services
RTD	=	Radio Tanzania Dar es salaam
BIS	=	Business Information Services
IICD	=	International Institute of Communication and Development
FSU	=	Food Security Unity
AMSDP	=	Agriculture Marketing System Development Programme
ICT	=	Information Communication Technology
NGO	=	Non Governmental Organization
FAO	=	Food and Agriculture Organization

WTP	=	Willingness to Pay
PRA	=	Participatory Rural Appraisal
CVM	=	Contingent Valuation Method
URT	=	United Republic of Tanzania
DALDO	=	District Agriculture and Livestock Development Officer
NARCO	=	National Ranching Company
Tsh	=	Tanzania shilling
Ha	=	Hectors
Km	=	Kilometers
KIFASCO	=	Kibaigwa Financial Saving and Credit Society
IFAD	=	International Fund for Agriculture Development
MVIWATA	=	<i>Mtandao wa Vikundi Vya Wakulima Tanzania</i> (Tanzania Farmers' Network)
RMDP	=	Rural market development programme
AFD	=	France Development Agency
IFPRI	=	International Food Policy Research Institute

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background information

Agricultural marketing in sub-Saharan Africa is confronted by a number of chronic problems. These include imperfect information, lack of timely delivery of information on prices, sources of supplies, information on major demand centers, quality characteristics and alternative marketing channels (Poole *et al.*, 2000). This in turn has led to poor returns to the production and marketing system as a whole.

For a very long time, farmers have had to make decisions on what to plant, when to plant, where to sell and at what price. This was not a very complicated task especially before market liberalization. There was little need for market information services in African countries because there were commodity marketing boards, which purchased crops at annually fixed national prices (Ferris and Muganga, 2002). This highly interventionist system was good for farmers, as marketing risk was shared between the government and farmers. Farmers were able to plan their production based on a known buyer and base market prices. This is still practiced in the European Union and USA until to date costing nearly a billion dollars a day (Ferris and Muganga, 2002).

Liberalization of agricultural markets has introduced new challenges to farmers, especially smallholder poor farmers. Government marketing boards can no longer guarantee the farmer with the market for their produce. Equally, buyers of commodities from farmers (i.e. traders, processors, or consumers) do not have

sufficient information about commodity sources, or the quantities and qualities of those commodities available and their prices (Mukhebi, 2004). Farmers are now facing markets which are neither competitive nor transparent and they are greatly disadvantaged, especially those in remote areas. They lack incentives to increase the level of their production and productivity in order to alleviate poverty in which many live in (Mukhebi, 2004).

Good quality information on markets and the information that can be generated from price trends could reduce risks and uncertainties and hence enhance the nature and the degree of market participation. Such information sheds light, on the farmer's side, on where the buyers are, the need to target lucrative periods to dispose commodities and whether it is necessary to manage reserves in store or own houses. All this knowledge provides leverage to the farmer in negotiating deals with traders (Temu *et al.*, 2004). By knowing such information, for example, a farmer may decide how much to produce, when and where to sell. Likewise through market information, traders may expand trade and consumers may find out alternative sources of supply.

The agricultural sector in Tanzania is beset with a high degree of uncertainty due to the nature and structure of the production sector, organization of the marketing system and natural hazards. Production is characterized by a large number of small, scattered farms and marketing is still unorganized, with too many middlemen handling small quantities of agricultural produce. Within such a structure, market information is deemed necessary to provide the right signals to participants. In fact, the existence and transmission of complete and accurate marketing information is a

key in achieving both operational and pricing efficiency in the marketing system (Beal, 1996). But despite the importance of market information, Tanzania like other developing countries, the weakness of government managed data bases, such as the then Market Development Bureau (MDB) of the Ministry of Agriculture during the 1970s and the 1980s, has been documented in the literature (Seldler, 1993; Schubert, 1983).

## **1.2 Agriculture market information**

Onzowa (1995) pointed out that in all business activities, which involve the movement of commodities from production to consumption, is marketing. The farmer's market information needs are those that enable him/her to make rational and relevant decisions. Market information services have the function of collecting and processing market data systematically and continuously, and making it available to market participants in a form relevant for their decision making. Market information needs of small-scale farmers include:

- Information on product planning. This is information on what crop and variety to grow at a given season with marketability of such a crop as an important deciding factor.
- Information on current prices.
- Forecast of market trends. This type of information assists farmers in planning their market products.
- Information on sales timing. This assists farmers in ensuring that they do not cause a market glut. It enables them to stagger harvesting and quantity for marketing.

- Information on improved marketing practices. It includes information on improved harvesting methods.
- Information on group marketing. This enables small-scale farmers to have organized sales of marketable surplus and bulk transport of produce.

Studies such as Kleih, *et al.* (1999) have shown that farmers and traders require more than market information, which is primarily based on prices. Traditionally, extension services were given a leading role in providing this kind of information. However, at best, the results have been mixed, particular emphasis has been on production where farmers in commercial agriculture equally require technical information on production management, post-harvest aspects, which include storage, transport, processing and marketing.

### **1.3 Tanzania agricultural market information services**

In Tanzania, the Ministry of Industry Trade and Marketing in collaboration with the Ministry of Livestock Development (MLD) and the Ministry of Agriculture, Food Security and Cooperatives (MAFC) are responsible for collection and dissemination of marketing information. Other public and private institutions participate at different degrees in the process. The agricultural marketing information that is collected by the Ministry of Industry, Trade and Marketing includes wholesale and retail prices of food crops, livestock products, agricultural input prices, free on board (fob) and farm gate price of export crops. Such information is intended to help farmers and traders to make informed production and marketing decisions, especially now when the market

of both agricultural and livestock commodities and inputs have been liberalized (MCM, 2004).

#### **1.4 Problem statement and justification**

Changes in many economic policies in 1990's particularly the adoption of market economy has rendered some of the functions of many institutions obsolete. Market information services being not the exception had been affected by these policy changes. How is agricultural market information services functioning and mode of operation adapted after these policy changes is the main challenge (Mbiha *et al.*, 2002). Due to these changes, the challenges are now greater than ever. How do we make markets operate more efficiently, how can agricultural production be more efficient? And how are we going to link farmers to markets? Are key questions to date.

In Tanzania like in other developing countries, institutions for risk management and market information are missing. Most farmers and traders rely on informal mechanisms and networks to cope with risks and obtain market information (Kherallah, *et al.*, 2001). Under such conditions, the problem of asymmetric information access between small-scale farmers and traders and within sub-groups is likely to happen and become one of the major constraints in the traditional information delivery systems (Lynch and Ashimogo, 2000). As a result, middlemen often exploit farmers and traders in local markets who offer relatively low prices, sometimes below production costs (KACE, 2005). Farmers remain ignorant of better markets (prices) opportunities that exist elsewhere in the liberalized market. Low

prices and lack of access to better markets results into low farm incomes, keeping the farmer in a vicious cycle of poverty (KACE, 2005).

The result of the lack of market support services such as agriculture market information is a marginalized agricultural sector made up of millions of atomized farmers working on low input, output and subsistence farming methods. These farmers do not fully appreciate market forces, and everyday are unable to answer some of the basic marketing questions such as: Who is buying maize, beans millet etc.? What quality does he/she need? Where is he/she located? What quantities does he/she need? What price is he/she offering? (Ferris, *et al.*, 2002).

In their study of maize marketing at Kibaigwa village, Kongwa district James and Lazaro (1999) found that farmers in the study area had full knowledge of prices prevailing at the local Kibaigwa market in the Kongwa district. They obtained information by visiting the market places and allowed the spread of information. However, traders largely dictate the prices and farmers do not negotiate with the traders. This suggests the existence of asymmetric information between buyers and sellers, which may provoke problems such as adverse selection and modify the nature of their transactions or more generally the process of arbitrage (Bassolet and Lutz, 1999). This situation suggests that there is a problem in the currently available information services to farmers and therefore there is a need to empirically study the current sources, prioritize farmers' information needs and assess farmer's willingness to pay for improved information services, with the aim of seeking diverse ways to useful market information.

## **1.5 General Objective**

To assess the relevance of the current agricultural market information available to farmers for purpose of increasing their efficiency and effectiveness in agricultural commodity market exchange, and establish farmer's willingness and ability to access better information from a mix of alternatives sources.

### **1.5.1 Specific objectives**

- i. To assess the type of market information accessed by farmers in the study area.
- ii. To identify sources of information available for farmers.
- iii. To assess the frequency at which farmers receives market information.
- iv. To carry out contingency analysis on farmers willingness to pay for market information.

### **1.5.2 Hypotheses**

- i. Farmers willingness to pay exceed the cost of provision of market information

### **1.5.3 Research questions**

- i. What are the means of delivering market information used by farmers?
- ii. What kinds of market information are available and preferred by farmers?
- iii. What is the frequency of disseminating of information to farmers?
- iv. What are the areas of improvement in market information delivery?
- v. What are institutional constraints for provision of market information to farmers?

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Definition of terms**

##### **2.1.1 Market information**

Market information is usually regarded as data on prices, qualities and quantities exchanged, duly processed and made available to market participants (Pool, 1994). Market information reflects the current conditions on supply, demand, price trend, movement, and any other information pertinent to trading. This kind of information aids producers in production to plan and is reported in uniform terminology that places the producer and the buyer on a more equal bargaining basis. It enables exchange of information through bringing up business related issues with one voice.

##### **2.1.2 Market information services**

Austria, (1995) defined market information services as a mechanism through which collection, analysis and dissemination of information needed to help farmers in making decisions are organized and systematized. It is a service that is usually operated by the public sector (government ministry or a dependent agency or institute), which involves the collection on a regular basis of information on prices, and in some cases quantities supplied, of widely consumed agricultural products, from wholesale markets, rural assembly and retail markets. The dissemination of this type of information on a regular basis is through various means (bulletin boards, radio, or television bulletins, news papers, etc.) to farmers, traders, government officials, policy markers and others (Shepherd and Schalke, 1995).

The service is intended to help the interested group to increase market transparency, which in enables the user to make better informed production and marketing decisions, and eventually, increase their returns from the goods they produce or trade (Austria, 1995).

### **2.1.3 Market transparency**

Market transparency in agriculture marketing is defined as the degree of information that primary suppliers, traders, final consumers and market control institutions has about parameters relevant to their marketing decisions (Schubert, 1983). It reflects the full awareness of parties involved in business transactions and the prevailing market prices and other pertinent information. Transparency in markets facilitates ‘‘arbitrage’’ which is a process of exchange of commodities with the objective of taking advantage of price differences that exceed transaction costs (Shepherd and Schalke, 1995).

### **2.1.4 Asymmetric information**

This refers to a situation in which one party knows things but the other doesn't (Shepherd, 1997). Within agricultural system, it occurs in transactions where one party has better information than the other. Information asymmetry results into problems such as adverse selection and moral hazards (Encyclopedia Britannica, 2004).

### **2.1.5 Adverse selection**

In Encyclopedia Britannica (2004) adverse selection has also been referred as anti-selection, and is referred to a market process in which bad results occur due to information asymmetries between buyers and sellers; bad product(s) or customers are more likely to be selected. With adverse selection conditions, trade will often produce an asymmetric premium for either the buyers or sellers, if one trader has better or more complete information (e.g. about what other traders are doing) than the average will be at the advantageous side of winning more profit than others. Thus when buyers have better information than the sellers or conversely, trade may occur at lower or higher price than other wise.

### **2.1.6 The difference between market and marketing information**

Shepherd (1997) distinguished between market information and marketing information, the former emphasizes collection and dissemination of prices and quantities, whereas the latter represents a much wider concept, including information on market channels, potential buyers and their contacts, payment requirements, quality and standards.

## **2.2 Agriculture and market information**

Agriculture as an industry is directly linked to market through market information; it is through this valuable tool, that key players in the industry can make informed decisions on production and marketing of their produce. This tool plays a great role in linking agricultural produce with the market especially nowadays where there is emphasis to transform small scale farming to commercial farming. Thus farmers

needs to be aware of prices and markets for their produce before they decide to invest in production.

### **2.2.1 The role of information in agriculture**

To make informed decisions and manage risk, all stakeholders in the agricultural production, processing and marketing chain, must have reliable and timely information. Farmers, for instance, need information so as to choose what to produce, what technology to apply for production, when to produce, for whom to produce, when to and at what price to sell (Mukhebi, 2004). Farmers can use market information in two ways. Current or immediate information can be used to negotiate with traders and to decide whether or not to go to the market, to visit, or to supply. Historical information, such as time series of prices over several years, can be used to make decisions regarding product diversification and the production of out-of-season crops (Shepherd, 2001). Adequate knowledge on prices, quantities, condition of sales and qualities offered at the market, is from a micro economic point of view, indispensable for rational production, marketing and consumption decisions (Schubert, 1983).

Traders, processor, and bankers require information to exploit business and trade opportunities provided by the liberalized market environment. The government requires information to be able to make appropriate policies and also measure and monitor changes in the agriculture sector for economic growth. (Mukhebi, 1999). It is therefore pertinent to examine the role of information in assisting smallholders to market their agriculture produce.

Availability of information encourages new entrants into the marketing system. In long term it also provides farmers with the opportunity to plan and diversify their production in line with market demand and to schedule deliveries to the market at times when returns are most rewarding. In addition, market information can be a valuable input for early warning systems, by highlighting food shortages that may be reflected by high prices. Market information can also assist government planners to understand how markets work and develop better support strategies (Shepherd, 1997).

There are many published research findings by different researchers, which illustrate the benefits obtained by farmers from using market information. For example, a study by KDNP project in the District of Bungoma in Kenya covered farmers who sold maize via KACE MIS during the 2003/04 maize season and achieved a higher average price of Ksh 1 219 per 90kg bag (US \$, 181 per MT) as compared to those who did not and traded at Ksh 1 000 per bag (US \$, 148per MT) or 22 % less (Mukhebi, 2004). A study by IITA in Uganda reported that maize farmers in Uganda are in great need of information about the prevailing market price for their goods, the grades of product needed by the market and the source of assistance that may be available to them (Robbins and Ferris, 1999).

### **2.2.2 The role of information in the functioning of agricultural markets**

Perfect market prices convey information from consumer to firms/farmers concerning what consumer's want and from firms/farmers to consumers about the resource cost associated with consuming each commodity (Stiglitz, 1994). However,

one of the major constraints, which hamper the functioning of the market is imperfect information on the opportunities that market can offer. This characteristic of information constraints is intense in the developing economies, which are in transition from state controlled economies to liberalized market economies. One of the lessons of the economics of information is that in an environment where information is incomplete or asymmetric, agents have to manage risky situations, which impair the effective functioning of the markets (Stiglitz, 1986; Hoff *et al.*, 1993 and Bassolet and Lutz, 1999).

Market powers arising from the informational asymmetries have potential moral hazards. Ramatu *et al.* (2000) reported that rural smallholder maize producers in Ghana got information on prices through traders and other farmers. He argued that it was not good to depend on traders for information on price because the traders normally collude. This was indicated by the use of oversized bags by maize traders buying at home/farm. Traders insisted that “the maize in the sack should be pounded” as sack were filled. Lack of consistency on bag size prevented dissemination of reliable price information and created additional room for opportunism on the part of traders.

The availability of market information permits producers, traders and consumers to rationalize their buying and selling decisions. The market provides information from consumers to producers who in turn, respond to price signals by producing products in quantities and forms commensurate with prices and cost. Consequently, the availability and accessibility of information leads to the reduction of marketing

transaction costs (Bassolet and Lutz, 1999). Cooperative vertical trading relationships have the potential to resolve the problem of asymmetric information, reducing both the transaction costs of attenuating informational problems and the level of risk.

### **2.3 Market information provision approaches**

Some efforts have been made to offer access to relevant and timely market information to the bulk of stakeholders in African agriculture by African governments. It is clear, however, that these systems are inadequate and do not help in day to day problem of making commercial transactions in agricultural goods. Thus there has been increased efforts to build new approaches which will work closely with other market information providers, mainly in the private sector. The need for new approaches has increased in recent years; this increase has been due to market liberalization in almost all African economies.

#### **2.3.1 New approaches to market information provision**

If African agricultural development programs are to work, African governments need to take new approaches to information dissemination and management that grow out from a clear understanding of what farmers need in term of information. The results of difficulties associated with national level market information services have encouraged the development of new approaches, emphasizing the importance of information dissemination and collection at the local level. This, of course, reflects a general trend towards decentralization of government services (Shepherd, 2001).

For example in Kenya, the Kenya Agricultural Commodity Exchange (KACE) Limited, a private sector firm has developed a market information system (MIS). The system is based on the application of modern information and communication technologies (ICT) to help farmers, especially smallholder poor farmers in remote areas, to access better markets and price for their produce (KACE, 2006). A similar model adopted by KACE is being replicated in Malawi (Mukhebi, 2004). Such efforts are being developed in other countries such as Uganda, Rwanda and Ethiopia where there are ongoing interventions to commercialize market information (Robbins, 1999).

The renewed interest from some donors is due to the potential use of local FM radio stations that is making the localization of market information really feasible (Shepherd, 2001). For example, the core activities of Uganda Market Information Services are collection, compilation and dissemination of market information-mainly price. The process of collecting information covers the whole country and the collected information is broadcasted using nine radio stations through 12 programmes per week (Temu, *et al.*, 2004). One of the three pilot areas in Uganda presently uses local-language Radio Uganda services. Such a move is important in other African countries as well. However, emphasis should not just be on duplicating the price information collected by the national MIS but also on obtaining other relevant marketing information, such as the prevailing transport situation, the markets' turnover, and the number and type of buyers.

Another example is that of Mali, where Mali market information services (MIS) was decentralized in 1999, with the creation of 22 local offices throughout the country, in addition to the central office in Bamako. These local units are now responsible for collecting information and arranging for its local dissemination. This new service, funded by the Government has contracts with 24 local radio stations to disseminate price and quantity information's regarding food crops of local interest. Currently eight of the main local units are linked together by an FM radio-telephone system, and are equipped with e-mail. They can thus exchange price information among themselves and farmers have also asked that this service should be used for them to place "buy and sell" offers (Shepherd, 2001). The above examples are tentative activities to localize market information provision, taking advantage of the growing number of local FM radio stations. To date, external donors have mainly supported these experiments and it's too early to say whether these activities will be sustainable or whether they will experience the same problem as donor supported national MIS (Shepherd, 2001).

## **2.4 Market information services in Tanzania**

### **2.4.1 Evolution of market information services in Tanzania**

Since the early 1960s most of major food and cash crops were under the control of the government through cooperative and crop authorities. Marketing arrangements such as producer price, and consumer price for those commodities consumed domestically were tightly controlled by the state. As a result there was no need for market information Services for those scheduled crops, until when the Market Development Bureau (MDB) came into being in 1971. MDB created a Marketing

Information Unit (MIS) to concentrate on the unscheduled crops. These were fruits and vegetables, root crops and fish. The aim was to inform both producers and consumers about the status of supply and demand of these commodities in major producing and consuming centers (Mbiha, *et al.*, 2002).

In the early 1980s, even before market liberalization, MDB had already extended its coverage to include unofficial parallel markets. However, such information became legitimate and was acknowledged by the government after the adoption of market oriented economic policies in 1986 (Mbiha, *et al.*, 2002). After liberalization, the MDB continued undergoing gradual transformation in terms of functions, organizational structure and commodity coverage. As a reflection to such changes the department name alternated from MDB to Agricultural Information Services (AIS) and Market Information Services (Mbiha *et al.*, 2002). Under the recent changes market information services has been transferred from the Ministry of Cooperatives and Marketing to the Ministry of Trade, Industry and Marketing.

#### **2.4.2 Awareness of market information disseminated in Tanzania**

Results of the survey conducted by the Ministry of Cooperative and Marketing (2004), to examine whether stakeholders in agricultural marketing were aware of marketing information disseminated by government through news media. The results showed that 76.0% of respondents were aware of existence of a program on Radio Tanzania (RTD), which gives market snapshots about prices of selected commodities. Nevertheless, those who were aware of the marketing information broadcast did not make close a follow-up. As it was found that only 17.2% of all

stakeholders interviewed make close follow up of the programme because they had listened to the marketing information program on the day of the interview or the day before. That means, the remaining 82.8% had heard the program for the last time a week or earlier than that. Those who had heard the program a month earlier accounted for 33.4%, this being the highest percentage.

A similar trend was observed on the part of newspapers, but it seems follow-up in the case of newspaper readers is better than of the radio listeners. About 27% of respondents had read the marketing information in the newspaper on the day of interview or a day before, while 73% of respondents, a week or more time had elapsed since they read marketing information in the newspaper. This situation suggest that there is a weakness in the information system as stakeholders do not pay adequate attention to information disseminated as it does not provide an accurate reflection of the prevailing market prices or they receive the information too infrequently.

## **2.5 Organizations involved in MIS in Tanzania**

There are several agents involved in the provision of market information in Tanzania, these include; Business Information Services (BIS), Ministry of Industry, Trade and Marketing, Agricultural Marketing System Development Programme (AMSDP).

### **2.5.1 Business information services (BIS)**

The BIS was established with the support from the International Institute of Communication and Development (IICD), mostly in the acquisition of computer equipment. The BIS has institutional links with Business Care Service and Business

Times, which is the leading business newspaper in the country. Currently the BIS has agricultural market information on their website, mainly for Dar es Salaam and Mbeya. It used to cover more regions but had stopped this due to financial constraints. Mostly it covers the principal food crops such as maize. Some historical data seem to be somewhat out of date (Kleih, *et al.*, 1999). This trend of financial problems and lack of commitments have been documented e.g. Coulter and Golob (1992), thus form constraints to the development of system that could provide information to the smallholder producers.

### **2.5.2 Ministry of Industry, Trade and Marketing**

The ministry operates an agricultural Market Information Service, which covers 27 commodities and 44 markets all over the country (Mbiha, *et al.*, 2002). Information collected is disseminated through radio and newspapers. Newspapers reach rural areas slowly and small-scale farmers cannot afford to buy, while the broadcast is on the national radio which is not well received in rural remote areas. Also national radio broadcasts do not cover some prices from major urban fruit and vegetable markets. The problem with this system is that, it is increasingly being recognized that farmers who sell mainly to local retail or assembly markets have considerable difficulties in relating information about a few central markets to their own, and thus there is a need to make information available about local markets. Broadcasting this type of information could not be relevant to farmers in their catchments area (Shepherd, 2001).

MIS does not have a website on internet. Other agencies involved in the provision of agricultural market information in Tanzania include the Food Security Unit (FSU) (Kleih, *et al.*, 1999).

### **2.5.3 Agricultural marketing system development programme (AMSDP)**

This programme is under the Prime Minister Office. It also have a market information component and is planning to set up a website.

## **2.6 Sources of general information**

Identification of existing information sources for farmers and traders is of great importance in understanding their availability and it gives insights of information constraints facing agricultural marketing system.

### **2.6.1 Source of information1 farmers and traders**

Smallholder producers usually have poor access to markets and information sources compared to traders. Even in agricultural markets of advanced economies, farmers tend to be passive marketers, reliant on informal sources and ‘word of mouth’ (Poole *et al.*, 1998). Constraints are due to geographical distance, physical access, time and altitudinal considerations. In addition to neighbors and friends, traders often assume a significant role as suppliers of information to smallholder producers.

Field studies carried out by Bagnall-Oakeley *et al.* (2002) in Lira and Soroti districts in Uganda, “revealed considerable differences in the number and quality of information sources between differing wealth groups of farmers, but not much difference between farmers in the ‘poor men’ and ”poor women groupings”. The

poorest groups obtained most of their agricultural information from farmer-farmer sources (other farmers and neighbors, family, friends and “contact farmers”), whilst the middle and wealthy groups obtained more information from local government sources, public extension, agri-business firms and NGOs. The more wealthy groups tend to discount farmer-farmer information sources as not always reliable as other sources. Public extension and FM radio were cited as important information sources for all wealth categories, but more wealthy groups gave higher assessments in terms of frequency and quality of information flow from these sources than did the poorest groups.

Larger-scale traders usually have their own information networks relying on more or less modern communications technology (e.g. fax, e-mail and mobile phones). Although they are generally well informed about local markets, small-scale traders lack the resources to monitor such market on regular basis (Shepherd, 1997). They depend more on word-of-mouth information, which in turn depends on the existence of traditional communication channels such as telephone lines, and a functioning transport infrastructure (Kleih *et al.*, 1999).

### **2.6.2 Sources of information for farmers and traders in Tanzania**

The results of the assessment of market information needs to agriculture marketing stakeholders by the Ministry of Co-operative and Marketing in Tanzania (2004) revealed that sources of market information depend on the type and the level of the market, but friends and neighbor, traders and radio were important sources of

**Table 1. Information needs of farmers**

<b>Decision</b>	<b>Information Required</b>
What crop to plant?	Historical prices of different crops
What variety?	Prices of different varieties Production costs of different crops and varieties
When to plant?	Seasonal variations in prices
When to sell?	
Should I harvest?	Current prices in different markets
Where to sell?	Marketing costs for alternative markets

Source: Poon, (2001)

It was also stressed by Robbins (1998) that, farmers need to be able to compare local market conditions with those further away, prices between one grade of product and another and they need information on individual traders, track records so that they can avoid those that are untrustworthy.

## **2.8 Means of communication of information**

Several means of communication of information exist worldwide. But few are particularly applicable to the African environment; these include, radio, word of mouth, dialogue, printed media, audial-visual tools, information and communication tools.

### **2.8.1 Radio**

Radio is among the most effective and appropriate means of communicating information in remote areas to farmers, many of whom have low education (Robbins, 1998). This also applies to the dissemination of market information. There is a considerable effort within the African region to localize market information provision, taking advantage of the growing number of local FM radio stations. This is due to the fact that it has been increasingly being recognized that farmers who sell

mainly to local retail or assembly markets have considerable difficulties in relating information about a few central markets to their own needs and thus there is a need to make information available about local markets. This has been supported by findings by Kleih *et al.* (1999) in Uganda, which revealed that farmers have a preference for local radio stations broadcasting in vernacular. This study indicates also that at least part of the information should be related to the context of specific locality (i.e. commune or region) rather than state as a whole.

Problems noted with radio-broadcast information included reliability (few broadcasts use professional agricultural staff), difficulties in knowing when agricultural broadcasts will occur, and the choice of commodities and enterprises to be discussed. Choices are often made according to sponsors' interests rather than users' needs. Sometimes where broadcasts are used, there are usually in the national radio and are often only in one or two languages and are often broadcasted when farmers are in the fields (Shepherd, 2001).

### **2.8.2 Word of mouth**

This is type of communication, plays an important role in most parts of Africa. The volume of traffic and movement of people, which is a function of road infrastructure and availability of means of transportation, influence this type of information flow. Market and other centers of social gathering are places of high turnover of word of mouth information (Kleih *et al.*, 1999).

### **2.8.3 Dialogue**

This is the type of communication is used in workshops or seminars. Agricultural extension staff commonly uses this type of communication. Exhibitions, trade fairs and study tours are also mechanisms for communicating information where farmers and traders mainly benefit from the visual impression of an object. Although they can be very useful, it is unlikely that the majority of the population in rural areas will be able to benefit from this type of communication (Kleih *et al.*, 1999). Also such gatherings are not continuous thus denies recipient of continuous supply of information.

### **2.8.4 Printed media**

This type of information communication has played an important role in market information dissemination. Often, information has been disseminated in newspapers, newsletters and bulletin boards. Key problems with printed media include low literacy amongst targeted recipients and language, where the majority of farmers in isolated communities are unlikely to read English. Other constraints with printed media such as newspapers are delay in reaching remote villages. On the other hand, in other places, posters written in vernacular languages have proved to be effective in communicating straightforward technical messages (Kleih *et al.*, 1999). A research report in Uganda by Janowski *et al.* (2003) reported on findings that newspapers were mentioned as occasional information sources by the more wealthy groups of farmers.

### **2.8.5 Audial-visual tools**

A mobile video van could be an effective form of audio visual tool in areas with easy road access. However, these are less appropriate in remote areas and where large populations need to be reached. Maintenance of equipment can be an issue too (Kleih *et al.*, 1999).

### **2.8.6 Information and communication technologies (ICT)**

New communication technologies, which started only to exist during the 1990s, can be very useful. Examples include cellular phones, e-mail connections, internet and Television. Cheaper satellite technology has greatly helped to spread these means of communication. Consequently the development of an Information and Communication Technology (ICT) is a basic ingredient in any competitive strategy to foster efficient flow of information in decision-making (Mdoe *et al.*, 2001).

Progress in ICT has not only made possible for business to process and communicate vastly more information at reduced cost, but to manage day-to-day, far-flung and widely dispersed production and service networks. Moreover, advances in ICT have increased the transportability of many information-based services, enabling them to be traded across distances without necessarily being embodied in people or goods (UNCTAD, 1996). Advances in ICT can induce more trade and foreign direct investment in countries with appropriate policy (Kamuzora, 2001).

between WTP and social economic variables such as education and wealth. However, the study did not estimate the influence of these variables on willingness to pay for improved market information.

Another study was done by the Ministry of Cooperative and Marketing in 2004, to examine agriculture marketing information needs by stakeholders in the agriculture marketing sector in Tanzania. The study involved stakeholders like producers, whole sellers, retailers, brokers, processors, exporters and provider of various services along the agriculture commodity supply chain. The methodology employed involved stakeholders and market information institutions survey. The survey examined whether stakeholders were aware of marketing information disseminated by government through news media. This was important to determine the effectiveness of the approach used in disseminating marketing information before new approaches were to be employed. The survey also assessed the ownership and access to telecommunication and media sources, which are prerequisite in accessing marketing information.

Shepherd and Schalke (1995) adopted a “rapid marketing appraisal” approach when assessing the Indonesian horticultural market information services. They employed open interviews with farmers, collectors, traders and government officials, to cover areas such as the farming system, the marketing system, and farmer’s sources of price information and price formation. The study found that the main users of market information were farmers. Farmers tended to use local price broadcasts as a check on the prices they receive, and more importantly, as an aid to negotiating with traders

the following day. They also found that substantial part of vegetable farmers are commercial farmers, rather than subsistence farmers selling occasional surpluses, and that almost all such farmers listened to the price broadcasts on a regular basis and greatly appreciated them.

In another study by Crase and Dollery (1999) to evaluate market information from livestock selling complexes, the authors directly uncovered the value of market information gained by visiting livestock sale yard. They utilized the Travel Cost Method (TCM) usually reserved for valuing environmental goods. The study assumed that, the uses of sale yard would reveal their demand for market information through their travel frequency to the sale yard venue. Moreover, the rational consumer of this information would disclose their reservation price via travel expenditure. TCM was employed in its simplest form because it uses expenditure incurred by individuals in visiting a particular site as a surrogate for the price paid to acquire the benefit available at that site. The study found that this methodology was likely to understate the value of market information gleaned from saleyards, since livestock marketing reports provide summary information as a public good.

The article by Bassolet and Lutz (1999) evaluated the existence to which market information, in Burkina Faso has contributed to the integration of the cereal markets after market liberalization in 1992. The objective of the analysis was to asses the impact of the liberalization, and in particular the installation of the market information system (SIM), on arbitrage and market integration and to ascertain whether market integration ameliorates, in the sense that price integration becomes

more efficient. A cointegration analysis was employed and a comparison of the result for the whole period under study (1990-5) with the result for the period 'after the *SIM*' (1992/05) was done. The study found that the impact of the diffusion of prices does not have a significant influence on market integration of cereal markets.

Results of the research project on Decentralized market information services in Lira District in Uganda by Janowski *et al.* (2003) employed the sustainable livelihood approach, with particular emphasis placed on human and social capital in context of information need and sources, as well as farmer group formation. In addition, a better understanding of the general livelihoods situation of the rural population in Lira District was sought. The tool used were PRA sessions, held with village leaders, teachers, and administrative staff, with members of organized farmers groups in both remote parts of the sub-country. Complementing the PRA work, a separate questionnaire survey was also being administered to farmer's households. In addition, traders were also interviewed using a different questionnaire, regarding their information requirements and communication channels.

The study findings revealed that radio was the most important source of information for farmers followed by family-friend-neighbors, local government representatives, religious leaders, extension officers, traders, news papers, politicians, billboards and posters. Crop productions, followed by price information, health and livestock production, were the main areas of which household needed more information.

### 2.9.2 Contingent valuation method (CVM)

The methodology is called contingent valuation because the interviewer poses questions within the context of a hypothetical market situation and the values that are derived are "contingent" upon the scenario becoming a reality (Fredericksen, 2002). CVM studies ask respondents directly what they are willing to pay to maintain or increase the level, quality or quantity of a good or service taking their budget constraint into consideration (Rose, 2005). Evaluation of non market goods or goods which are not currently on the market like the potential benefit of a particular change in policy is performed by contingent valuation. Contingent is based on the argument that individual responses to hypothetical markets are comparable to actual markets.

Mitchell and Carson (1989) pointed out that hypothetical-direct methods, like Contingent Valuation Methods, can be used to directly measure points on individuals compensated demand curve, avoiding potential bias due to a researcher's assumptions about trade-offs by allowing the respondents to make their own trade off in terms of money (Rose, 2005). The contingency valuation method has been used to assess willingness to contribute labour and money to tsetse control in Kenya (Echessah *et al.*, 1979), consumer willingness to pay for low-pesticide fresh vegetable in Taiwan (Fu *et al.*, 1999), willingness to pay for alternative energy sources in Uganda (Kazoora, 2000) and willingness to pay for rural water supply in Ghana (Fredericksen, 2002).

However, Fredericksen (2002) contends that the contingent valuation methodology suffers from following potential sources of bias. Strategic bias: this may occur when

respondents try to act strategically, a reflection of what they feel will be built into with their answers. If they feel they may actually have to pay the amount they answer, they may undervalue their true responses. If they feel that high value answers will bring about changes they would like to see but they know they will not actually have to pay this amount, they may overstate the amount they would actually be willing to pay.

Others include Instrumental biases: this arises if the respondent is hostile to the means by which payment would be collected. The vehicle chosen for payment (e.g. taxation, user fees) may result in different WTP responses. Moreover, some people accustomed to certain public goods and services being provided free of charge may protest at any kind of payment and be unwilling to pay anything. Starting-point bias: in this case the interviewer may bias the respondent's answer by establishing a reference point for an acceptable range of bids. Hypothetical bias: people may not give answers which reflect their true values, particularly if they have no incentive to answer correctly the questions that take time and thought. Constant budget bias: this originates from the hypothesis that each individual has a type of mental budget for the environmental goods and services. In contingent valuation methodologies, individuals simply are asked how much they are willing to pay for a given market information service. The method assumes that respondents give more meaningful answers to direct questions and use number of payment elicitation models including bidding games, payment cards (payment scale), and binary choice.

The payment scale procedure allow respondents to choose a value or price (cost) on a given scale measure. A range of values is presented to the respondents and they are asked to identify one value or price or cost they are willing to pay or incur to purchase the good or service being evaluated. The respondent choice from a given scale indicates the WTP for stated good or services. A positive value indicates positive demand, and zero values indicate zero demand for the good or service. The limitation of the payment scale is constructing a scale. This limitation can be reduced through using available market and non market information to construct the scale as suggested by Donaldson *et al.* (1997).

The discrete choice (Yes\No) format is most similar to a consumer making a choice to purchase a good given price or to voting yes or no in a referendum (Rose, 2005). The format of WTP question followed the recommended practice, stating a need to consider constraints, payment mechanism and the nature of the change in the hypothetical market

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter presents the theoretical framework behind my empirical model based upon the work of Hirshleifer and Riley (1992). It covers the conceptual framework governing the study, describes the study area, types and sources of data, the sampling procedure, show the sample size and data analysis method

#### 3.2 Theoretical framework

Producers usually face a real complex economic environment. They face multiple risks and must carefully choose information among many messages conveyed by an equivalently large number of information services (sources). In this section, the study briefly reviewed the theoretical framework of Hirshleifer and Riley (1992) in order to build our empirical model. The study derived expectations about the impact of different exogenous variables on willingness to pay for information services. The study supposed that there exist a finite number of different states in the world;  $S$ . Producers' profits can take a different value in each state. A producer can obtain information from  $J$  different information sources about future states of the world. Each information source can provide one of  $M$  information message.

Based upon the message received, a producer will choose the optimal course of actions and/or will update his/her planned actions. A producer initially assigns his/her own subjective probabilities about each of the random states,  $P_s, s = 1, \dots, S$ .

Let  $q_m$  represent the unconditional probability of receiving message  $m$  ( $m = 1, \dots, M$ ) and define the joint probability of state  $s$  and message  $m$  as  $j_{sm}$ , such that  $\sum_m j_{sm} = P_s$  and  $\sum_s j_{sm} = q_m$ .

With this framework, the study wished to emphasize the conditions under which an individual producer will decide to obtain information from source  $j$ . The study supposed that each information service can only provide a message to a producer among the set of available messages,  $M$ . Upon reception of the new information, a producer will convert his/her prior probabilities,  $p_s$ , into posterior probabilities,  $\rho_{sm}$ , where  $\rho_{sm}$  is the conditional probability of state  $s$  given the message  $m$ . Following Bayes theorem, the posterior probability is calculated as  $\rho_{sm} = j_{sm} / q_m$ .

Under Bayesian rules, the more confident a producer is about her own prior beliefs, the less likely he/she is to acquire information about future random states of the world, since any new information will marginally impact her posterior probabilities. Hence, empirical application of the theory must approximate a producer's confidence in his/her beliefs. Moreover, the joint probability of state  $s$  given message  $m$  can be rewritten as  $j_{sm} = l_{sm} / q_m$ , where the element  $l_{sm}$  is used to form the likelihood matrix or, equivalently, is the conditional probability of message  $m$  given state  $s$ . Hirshleifer and Riley (1992) labeled the matrix of conditional probabilities as the credence matrix of the producer. The credibility of the information message should be directly related to the producers' confidence in the information service.

The expected value of information service  $j$  for producer  $i$ , which was measured by this study as willingness to pay for information service denoted  $\Omega_{ij}$ , is the sum of the expected utility of information message  $m$  weighted by the marginal probabilities of receiving that message minus the expected utility of the uninformed action. Hence, expected value of the message service is simply the difference between expected utility with and without the service:

$$\Omega_{ij} = \sum_m \sum_s q_m \rho_{sm} U_i(\pi_{sm}) - \sum_m \sum_s q_m \rho_{sm} U_i(\pi_{s0}) \dots \dots \dots (i)$$

Where;

$\Omega_{ij}$  = Is the expected value of information service  $j$  for producer  $I$  measured as willingness to pay for information service.

$\pi_{sm}$  = Is the informed profit level in state  $s$

$\pi_{s0}$  = Is the uninformed profit level in state  $s$ .

Eq. (i) does not include the costs associated with the acquisition of information from source  $j$ . It can be shown that the value of information is a decreasing function of the producer's confidence in his/her beliefs. This is rather intuitive since higher prior confidence implies smaller revisions of beliefs for any given message.

In this application, producers can choose among a set of different information services. A message service  $h$  will be more informative than another service  $j$  if using the service  $h$  provides a higher expected utility than information service  $j$ . Obviously, the preference for an information service over another will depend upon the prior belief of a producer and his/her preference mapping over all possible outcomes.

Using the definition of posterior probabilities, we can substitute for  $\rho_{sm}$  in Eq. (i) and adjust Eq. (i) for the cost of obtaining the information ( $C_j$ ):

$$\Omega^*_{ij} = E[U_i(\pi_{sm} - C_j) | I_{sm}, P_s] - E[U_i(\pi_0) | P_s] \dots \dots \dots (ii)$$

Therefore, a producer will refer to information service  $j$  if  $\Omega^*_{ij} > 0$ . The utility function of the producer is unobservable by the researcher and thus the study considered it as a random variable. The study denoted the potentially observable portion of the expected utility function by  $V[\pi; \theta]$ , where  $\theta$  is the vector of all parameters of interest to be estimated. The utility function becomes:

$$E[U_i(\pi_{sm} - C_j) | I_{sm}, P_s] = V_i[\pi_i; \theta] + u_i \dots \dots \dots (iii)$$

Where;

$u_i$  = is an independently distributed random variable.

The study later assumed that the portion of the utility function that is observable can be approximated by an index function of producer's characteristics. For the purpose of estimation, the study used the random utility framework to impose a little more structure on Eq. (ii):

$$\Omega^*_{ij} = V(\pi_{sm} - C_j) + u_{ij} - V_i(\pi_0) - u_{i0} > 0 \dots \dots \dots (iv)$$

To make it simpler for implementation in the analysis program, abbreviations in Eq (iv) above were defined as:

$$\begin{aligned} y^*_{ij} &\equiv \Omega^*_{ij} \\ \beta_j X_{ij} &\equiv V_i(\pi_{sm} - C_j) - V_i(\pi_0) \text{ and} \\ \varepsilon_{ij} &= u_{ij} - u_{i0} \end{aligned}$$

Therefore the observed producer's decision to acquire information from source  $j$  was represented as:

$$y_j = \begin{cases} 1 & \text{if } y_j^* \equiv \beta_j X_j + \varepsilon_j > 0 \\ 0 & \text{otherwise} \end{cases} \dots\dots\dots(v)$$

Where;

$y_j = 1$  indicates valid response (Willing to pay for market information)

$y_j = 0$  indicates invalid response (not willing to pay for market information)

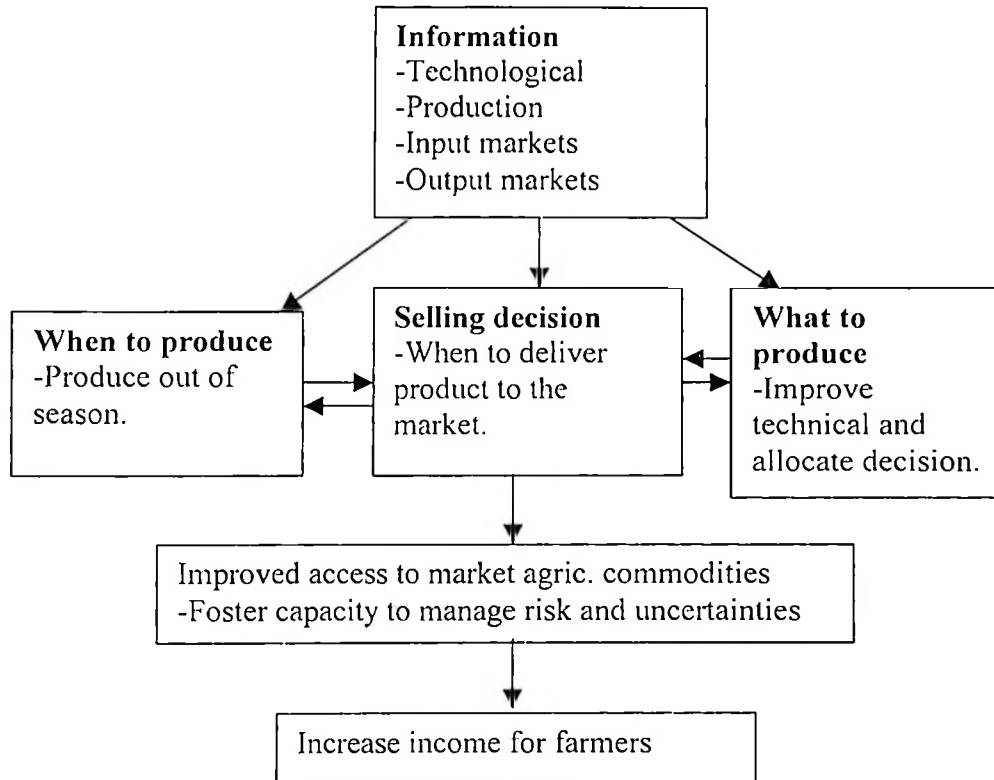
The first two moments of the random error term  $\varepsilon_i$  are  $E[\varepsilon_i] = 0$  and  $Var[\varepsilon_i] = 1$ .

From Eq. (v), the probability that producer  $i$  will buy information from source  $j$  is  $P[y_i^* > 0] = P[\varepsilon_i > -\beta_j X_i]$  if the distribution of  $\varepsilon_i$  is symmetric (such as the normal and logistic distribution). Thus the study assumed logistic distribution of variables.

### 3.3 Conceptual framework

The conceptual framework illustrates the relationship between access to market information and improved access to markets of agricultural produce. The framework illustrates the type of information needed by farmer and the benefits obtained from accessing particular type of knowledge. It's presented in Figure 1.

### Conceptual framework



**Figure 1: Conceptual framework**

The model conceptualizes that farmers perceive a need for a particular type of information in the context of his/her environment (such as marketing system) e.g. information on input markets, output markets, technological and production. These kinds of information assist the farmer to answer daily basic market questions such as; when to produce (for example, whether to produce out of season or not?). Access to market information can facilitate optimal decision making based on market incentives. In other words, access to information will assist a farmer in making decisions concerning the type of crop and the quantity to produce and concerning the best time to produce to maximize returns.

Selling decisions (when to deliver product to the market): good quality information on markets price and information that can be generated from price trends-reduces risk and uncertainty and hence enhance the nature and degree of market participation. Information, even at the simplest level of market information, i.e. prices, knowledge of past price trends can enable a farmer to form an opinion about the likely viability of storage and its associated risks. Knowledge of market information reduces risk and transaction costs of participating in the market. As a result, market participation will increase and market price will be more stable.

What to produce: availability of relevant, reliable production and market information on inputs and output markets is important to assist farmers to improve technical and allocative decisions. Information also has another vital function to assist the farmer to decide what to produce, since there may be a time delay of months or years between investing in a crop or herd and getting a profit. Farmers who understand market trends and market opportunities have a better chance of succeeding than those who do not (Mdoe *at al.*, 2002).

The perceived need of information leads the farmer to seek for information from various sources such as formal or informal sources. The relative importance of each source depends on a number of factors including accessibility and applicability of information obtained. Other factors that an information users (in this case a farmer) considers when selecting and using different information sources include costs, past success, accuracy, reliability, comprehensiveness, currency, technical, quality and format of the information (Shanmugan, 1999:Yang, 1998).

Identification of specific information need and the major source of obtaining information by farmers is the major concern of this study. The result will provide insight on basic information support required for the key intermediaries in information dissemination for farmers and also assist in formulating procedures to design institution framework for improving provision of information to small-scale farmers.

### **3.4 Description of the study area**

#### **3.4.1 Location**

Kongwa district, lies at 5° 30-6' S and 36° 15-36' E. It is one of the five districts in Dodoma region, others being Dodoma rural, Mpwapwa, Kondoa and Dodoma urban (URT, 2003). Dodoma region which lies between 4°-7° South latitudes and 35°-37° East longitudes is centrally positioned in Tanzania. Kongwa district borders Dodoma rural district in the Western front, Kiteto District (Manyara region) on the North, Kilosa district (Morogoro region) on the East and Mpwapwa district on the Southern front. The altitude of Kongwa lies between 900 and 1000metres above sea level. Kongwa district was formed in 1996 as an independent district. Formerly, it was part of Mpwapwa district (URT, 2003).

#### **3.4.2 Administrative area and population**

The district is the smallest in the region and covers an area of 4,041sq.km. equivalent to 10% of the total area of Dodoma region (District Council, 2004). The area is divided into three divisions namely Kongwa, Mlali and Zoissa. There are 14 wards, 67 villages and 281 sub-villages. According to URT (2003) census report, the district

has a population of 249,760, accounting for 14.7% of region total and 0.7% of the country total.

### **3.4.3 Climate**

Kongwa has tropical climatic condition with high temperatures from the months of September to March when the sun is in the southern hemisphere. The highest temperatures recorded are 31<sup>0</sup> C while the lowest temperatures are 18<sup>0</sup> C. Nights are cooler than the days. The mean annual rainfall is 700mm. The rain season is normally between December and April. Generally, Dodoma has a dry savannah type of climate with average of 570mm rainfall, but rainfall is somewhat higher in Kongwa district average at 700mm, making the district more agriculturally productive than other districts (District Council, 2004).

### **3.4.4 Vegetation**

The district is covered with shrubs and spots of acacia and baobab trees. Grassland covers the north and north east areas bordering Kiteto district. Light forests cover areas close to Kilosa and Mpwapwa district. Most parts of the land have no grass during dry season due to persistent bad farming methods, overgrazing, tree felling for fire wood and charcoal production and forest clearing for subsistence farming (District Council, 2004).

## **3.5 Agriculture in Kongwa district**

The district is almost dependent on crop production and animal husbandry. Crop production ranks first followed by livestock production, in their contribution to the

district economy. The majority of the people still use poor and primitive farming methods and implements such as traditional hand hoes. Agriculture is characterized by low productivity as a result of low and erratic rainfall, high rate of evaporation and low moisture holding capacity of the soil. These conditions, coupled with poor farming methods, poor production technology, overstocking and overgrazing, create favorable conditions for soil degradation and hence poor productivity leading to a high incidence of poverty (District Council, 2004). The total available land for agriculture in the district is 323,280 hectares but only 91,243 hectares, that only is 28%, is under crop production (District Council, 2004). Therefore, the district has the potential and possibilities for agricultural expansion. The main staple crops in the district include sorghum, millet, groundnuts, beans and bambaranuts. While the major cash crops are maize, groundnuts, sunflower and sesame.

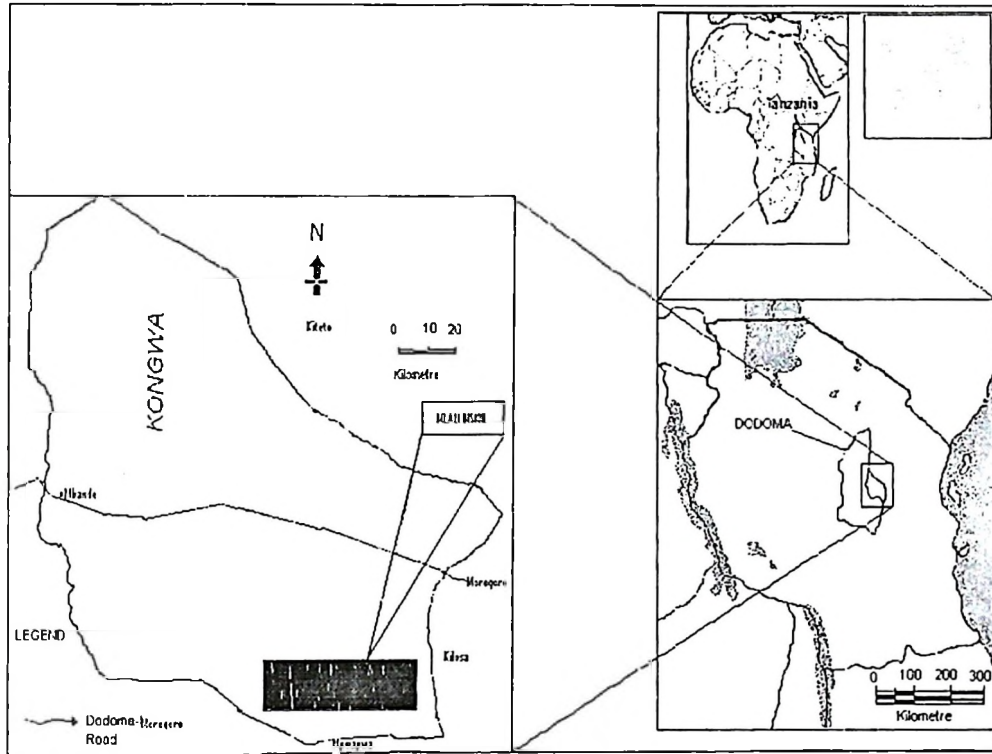
### **3.6 Livestock sector**

Livestock forms an important part of family wealth and savings. It provides an essential source of income to the owners. Livestock kept in the district include cattle, pigs, goats, sheep and donkeys. Ranching is also a potential activity undertaken in Kongwa. The National Ranching Company (NARCO), a state owned company, operated a successful beef business before being mismanaged in the mid 1980s(District Council, 2004).

### **3.7 Rationale for selecting Kongwa district as a study area**

The study was conducted in Kongwa district of Dodoma region. The district was selected because a large maize market exists in Kibaigwa village along the Dodoma-

Dar-es-salaam high way, about 100km east of Dodoma town where traders mainly from Dar as salaam buy maize from farmers. Kibaigwa market is located in the central maize belt of Tanzania, it is the largest maize market, and at times referred to as an international maize market as it draw its buyers from as far as Malawi, Zambia, Zimbabwe and Kenya. Maize is the single crop marketed at Kibaigwa, although small quantities of groundnuts and sunflower are also traded. Although maize in Kongwa district is grown in all the three divisions namely Nzoisa, Mlali and Kongwa, most production comes from Mlali and Nzoisa division. Therefore maize traded at Kibaigwa market by farmers come from these divisions and from Kiteto district in Manyara Region (DALDO, 2004). Therefore in this study Mlali and Nzoisa were chosen as representative divisions to obtain a sample of farmers.



**Figure 2: Map of Kongwa district, with sampled area**

### 3.8 Data requirements and sources

A structured questionnaire was designed to capture both quantitative and qualitative data. This consisted of both close and open-ended questions. Variables such as age, education, farm size, crop type, income, yield, fertilizer, input use, credit sources and requirements, types of assets owned, variables concerned with crop marketing information requirement of farmers and their willingness to pay for market information by farmers were captured using the questionnaire. The unit of study was a household, therefore appointments were made through the local leaders and visits were paid to respondents' residential areas for the interviews. Since most of the farmers were busy with farm operations, in certain situations the researcher was

obliged to interview farmers at the farm after they had performed their day's agricultural activities.

### **3.8.1 Research design**

A cross –sectional research design was used in this study. The cross sectional research design allows data to be collected at a single point in time that may be used in descriptive analysis and for determination of relationships between variables (Bailey, 1998). Limited time for fieldwork justifies the use of the selected design.

### **3.8.2 Questionnaire pretesting**

Questionnaire pretesting involved five respondents; it was conducted during the month of October 2005 before the main survey. This activity was undertaken in order to determine if there were any questions that would not yield responses from the farmers as well as checking if the questionnaire was compressive enough to collect the required information. It was also conducted to establish the sampling frames and units as well as to determine the approximate time required to complete the questionnaire. Pre-testing was conducted in Mkoka and Hembahemba Villages. After pretesting, some of the questions in the questionnaire were restructured and final a version was developed.

### **3.8.3 Sampling procedure**

#### **3.8.3.1 Population**

The population of the study was all farmers growing and selling maize in the district. The entire sample size from which information was collected is 280 respondents.

### **3.8.3.2 Sampling**

Simple random sampling technique was used to choose interviewee farmers from the sampling frame. Simple random sampling is usually considered adequate if the chances of selection are equal at any stage in the sampling process (Bailey, 1998). Farmers who sell their maize at home, village assembly, Kibaigwa market or other places were included. The sampling frame was obtained from the offices of village executive officers. Survey data were obtained using structured questionnaire.

### **3.8.3.3 Main field interviews**

The main survey was conducted in November 2005; the author carried out the survey with the assistance of twenty enumerators. A Swahili language was used throughout the survey, as farmers in the study area were not conversant with English language. A single interview took about two and half hours to complete.

## **3.9 Analytical technique**

To analyze the data both descriptive and qualitative statistics were employed based on the objectives and hypotheses to be tested and research questions to be answered. In the case of descriptive analysis, means, frequencies and percentages, were employed to describe the characteristics, type of information, the source of information and the frequency of dissemination of the information. Cross tabulation was used to establish the association between market information access and the variable sources of information.

### **3.9.1 Willingness to pay for market information**

In this study information on the hypothetical market for agricultural information was presented and farmer's decision to pay for agricultural information was determined by WTP question included (refer to the WPT questionnaire in appendix 1). This study utilized the payment scale (referendum model), as it provides incentives for truthful revelation of preferences and simplifies the cognitive task of respondents in making a choice (Hanley *et al.*, 2004).

Donaldson *et al.* (1997) suggests that the use of a payment scale is more valid than open-ended questions or closed ended questions approaches when presenting hypothetical bids. During the survey, a payment scale was constructed using available prices of obtaining market information from available sources in the study area. The prices ranged from Tsh 100 to 400. The range was based on the results of a pilot test and examination of prices of available means of information dissemination used in the study area. For instance, the cost of a text message is Tsh 54 regardless of length of the message. A service message can be Tsh100, cost of a news letter can amount to Tsh 250 and a cost of a news paper is Tsh 400.

### **3.9.2 The model**

From the theoretical framework, it is clear that for a farmer to be willing to pay for market information, he/she must be confident with the information source. However, this study did not assess farmer's confidence due to the fact that at present such information is considered to be a public good, more so in the context of small-scale farming. Therefore the model was derived to estimate the portion of the utility

function that is observable and which can be approximated by an index function of producer's characteristics. This is believed to influence farmer's willingness to pay for improved market information service.

In the empirical analysis of the determinant of willingness to pay (WTP), a function is typically estimated using some measure of response to the WTP question as the dependent variable, which is a function of variables expected or assumed to be determinants of the WTP. In our case, the choice of the regression tool was dictated by the measurement level of the response variable to test the hypothesis that farmers in the research area are willing to pay than the cost of provision of information. The Willingness to pay is a dichotomous variable, scoring 1 if a household is willing to pay and 0 if not.

Therefore, the proper form of a regression model is the binary logistic model, as suggested by Menard, 1995. The logit form of the probability is the most helpful to analyze dichotomous dependent variables.

Hence the following form of the model was adopted:

$$\text{Logit } (Y_j) = \text{Ln} \left[ \frac{P(Y_j = 1)}{1 - P(Y_j = 1)} \right] = b_0 + \sum_{i=1}^k b_i X_{ij} + u_j \dots \dots \dots \text{(vi)}$$

Where;

$P(Y_j = 1)$  is the probability that the household is willing to pay for observation j.

$X_i$  = the  $i^{th}$  predictor variable.

$b_0$  = is the model constant

$j$  = number of current observation or case

$i$  = refers to the  $i^{th}$  of the  $k$  independent variable in the model.

$k$  = number of variables in the model (in this case 7)

$b_i$  = unstandardised logistic regression coefficient for the  $i^{th}$  independent variable

$u_j$  = error term and prediction of the logits is computed as,

$$\text{Logit}(Y_j) = b_0 + \sum_{i=1}^k b_i X_{ij} \dots \dots \dots (vii)$$

**3.9.3 A consideration of independent variables of the regression equation**

The independent variables of the regression equation are as follows.

**(i) Age (number of years)**

Age is thought to influence attitudes towards information sources. These factors are related to a decision making. Elders are slower in adopting new technologies. In the Tanzanian case, where institutions which offer information for a price have never been operating, this situation is more likely to apply. Schnitkey *et al.* (1992) argues that age is related to farming experience that farmers with more experience should have less demand for external information. The variable was expected to record a negative sign in the regression equation.

**(ii) Education (number of years spent in school)**

The education level of the respondents is one of the factors affecting the adoption of new innovations and is thought to influence attitudes towards information sources. With respect to education, a higher level of education is expected to be positively related to the usefulness of information received from all information sources. Higher level of education should also influence the usefulness of information received from the sources that deliver the most sophisticated information (Gloy *et al.*, 2000). The variable was expected to be positively signed.

**(iii) Payment bid (Tsh)**

The analysis typically assumes that the probability of a no response increases with increasing offer amounts according to logistic distribution. The variable is thus expected to be positive sign.

**(iv) Farm size (Ha)**

There are several reasons why farm size might be related to the usefulness of information received from the media and personal sources thus increasing the willingness to pay for particular information. Large farms should be able to derive a greater benefit from the cost of information acquisition. Ford and Babb (1989); Gloy *et al.* (2000) found a positive relationship between farm size and the use of personal information sources. The variable is thus expected to be positive sign.

**(v) Distance from the village to main market (Km)**

Distance from the production site to the selling point and a source of agricultural inputs was expected to have a positive sign in the WTP model. This meant that as distance increases it adds to transport and transaction costs. Where the transport charges do not depend directly on distance, there is an implicit of time.

**(vi) Place of sale**

Producers in remote areas lack information not only on markets but also on other aspects of their business as a result of lack of communication infrastructure, insufficient movement of people and limited source of information. Also producers in remote areas are constrained with high transportation cost per unit of produce, which is the result of low volume of produce available for transportation, preventing economies of scale. Due to this reasons producers in such areas have to decide between selling at home to or transport to the market. The variable is thus expected to be positive sign.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents results and discussion of the study. The chapter is organized into the following sections; section 4.2 highlights respondents' general social-economic characteristics. Section 4.3 highlights agricultural production in the area. Third section, 4.4 describes marketing of agricultural production. Fourth section, 4.5 present assessment of farmers' access to market information. Section 4.6 present farmers' source of information. Sixth section, 4.7 describes the frequency which farmers receive information. Section 4.9 factors affecting farmer's decision to sell their maize and identifying maize marketing channels. Eighth section 4.10 presents logistic regression result on farmer's willingness to pay for market information and section 4.11 summaries the impact of the intervention of improved market infrastructure on market information access.

#### **4.2 Farmers social-economic characteristics**

Social-economic characteristics bear essential attributes to farmers and traders behaviors towards the need for market information. The characteristics of a respondents interviewed also have important social and economic implications for the respondents' opinion towards willingness to pay for improved market information.

#### 4.2.1 Age structure

The age composition shows that respondents with less than 18 years constituted only 0.7%, while those aged between 19-35 years constituted 37.9%. Furthermore, results reveal that respondents aged between 36-60 and those above 60 years were 53.2% and 8.2% respectively (Table 2). These results imply that most of the respondents are within the active working age group of 15 and 60 years.

**Table 2. Farmers social-economic characteristics in the study area**

Variable	Category	Frequency	Percentage
Age	Children (less than 18)	2	0.7
	Youth (19-35)	107	37.9
	Adult (36-60)	150	53.2
	Elders (above 61)	23	8.2
	<b>Total</b>	<b>282</b>	<b>100.0</b>
Sex	Male	261	92.6
	Female	21	7.4
	<b>Total</b>	<b>282</b>	<b>100.0</b>
Marital status	Married	254	90.1
	Not married	5	1.8
	Widowed/widower	18	6.4
	Divorced	3	1.1
	Separated	2	0.6
	<b>Total</b>	<b>282</b>	<b>100.0</b>
Education level	No formal education	40	14.2
	Primary education	210	74.4
	Secondary education	23	8.2
	Collage qualification	12	3.2
	<b>Total</b>	<b>282</b>	<b>100.0</b>
Economic activities	Farming	73	26.2
	Livestock& farming	92	32.5
	Trading and farming	98	34.6
	Employment and farming	19	6.7
	<b>Total</b>	<b>282</b>	<b>100.0</b>

#### 4.2.2 Sex of household heads

In the study area, the majority of the households (92.6%) were male headed. Very few were female headed, 7.4% of the total household. This small percent of female

headed households can be explained by two facts. First, most interviews were administered to heads of households, the majority of whom were men. Second, this is a common phenomenon in Africa traditions where most societies are patrilineal, and in such circumstances, husbands are in most cases the heads of household.

#### **4.2.3 Marital status**

Regarding marital status, it was found that the majority of respondents were married. Survey results (Table. 2) indicate that 90.1% of the respondents were married, 6.4% were widowers/widowed and 1.8% had never been married, while only 1.7 % were divorced or separated. The results suggest that a large proportion of respondents in the surveyed households were married and mature people, revealing the typical characteristics of many rural areas in Tanzania.

#### **4.2.4 Education**

Education was considered by the study as one of the key factors that can influence respondent's demand and hence opinion towards paying for improved market information. The study revealed average level of literacy in the study area, where about 74.4% of respondents had at least primary education, 8.2% had secondary education and 3.2% had some form college qualification (Table 2). A similar trend of higher number of people with primary education was also reported by the study on the assessment of agricultural marketing information needs (MCM, 2004).

#### **4.2.5 Main economic activities**

With regard to major economic activities, all of the respondents were engaged in crop production as the major source of income (Table 2). Apart from farming, 32.5%

practiced livestock keeping, 34.4% practiced trading business and 6.7% were salaried employees. This suggests that there is a high level of integration of crop-livestock and crop-trade activities in the farming households. Livestock, especially cattle are kept by farming households because of their products (especially milk) and are also used for draft power. The engagement of salaried employees in farming is seen as a coping strategy to supplement their low wage income levels.

### 4.3 Area under agricultural production

The main crops in the study area were found to be maize, groundnuts, sunflower and pigeon peas. Both mono and inter-cropping of these crops is practiced. However, maize is the main crop. The majority of farmers have been cultivating maize for more than ten years. Farm sizes ranged between 0.4 and 582 hectares, with a mean of 17.2 hectares. To extract more information regarding agricultural production in the study area, farm sizes owned by households were classified. The classes were less than 4ha (small farmers), between 4.1 and 8 (medium farmers), between 8.1 and 40 (large farmers), more than 40 ha (very large farmers).

**Table 3. Farm size in sampled households**

Farm size (hectars)	Number of respondents	Percentage
≤ 4 (small farmers)	128	45.7
4.1-8 (medium farmers)	54	19.3
8.1-40 (large farmers)	81	28.9
>40.1 (very large farmers)	17	6.1
<b>Total</b>	<b>280</b>	<b>100.0</b>

The distributions of farm sizes among the respondents interviewed were as follows; 45.7% of respondents have farm sizes of up to 4 hectares, 19.3% have between 4-8 hectares, 28.9% have between 8.1-40 hectares and 6.1% have more than 40.1 hectares

## 4.5 Type of information accessed by farmers

### 4.5.1 Farmer's access to specific type of information

The study results reveal that farming households have access to different types of information. It was observed that 90.4% of households have access to information on where to sell and about the market selling price and less of other types of information (Table 5). James and Lazaro (1999) reported similar findings. They noted that farmers in the study area had full knowledge of prevailing produce prices at the local Kibaigwa market. This is probably due to the fact that the market is located within the area. Thus farmers get information by visiting the market place and proximity allows for a quick spread of information around the nearby villages. This suggests that farmers exchange information mostly among themselves and get information mainly from informal sources. Thus the cost of assessing market information is relatively low due to proximity.

**Table 5. Farmer's access to specific type of information**

Type of information	Number	Frequency	Percentage
Where to sale	282	255	90.4
Market selling price	282	258	91.5
Where to buy inputs	277	119	42.9
Where to rent or buy agric equipments	269	137	50.9
Information about weather	281	230	81.5
Crop management i.e. post harvest pest control	271	62	22.9
Identifying new potential products	272	44	16.2
Information on collective marketing	270	41	15.2
Information on credit	278	169	60.8
Where to sale livestock and livestock products	267	63	23.6
Livestock selling price	267	63	23.6

The study also showed that about 81.5% of respondents have access to information about weather conditions (Table 5). This can be explained by the fact that

information on weather is broadcasted through the national radio every day and according to the assessment made by agricultural marketing information needs (MCM, 2004), Tanzanians depend more on radio for market information regardless of age, gender or education. Also 60.8% of farmers were observed to have access to information on credit (Table 5). This is probably due to the fact that in the study area, the local co-operative financial organization, the Kibaigwa financial saving and credit society (KIFASCO) operates. Thus farmers learn about availability and conditions for accessing credit from this institution, apparently located around the main market.

About 50.9% of farmers interviewed had access to information on where to rent or buy agriculture equipment. Farmers rent agricultural equipment especially tractors from owners who render their services for ploughing fields in the villages. Given the large cultivated areas and a need to ensure timely farm operations, farmers hire tractors for ploughing. Forty two percent of respondents had access to information on where to buy inputs (Table 5), which implies that this kind of information is limited to the majority of the farmers because it is obtained mainly from agricultural input suppliers operating in the area. Absence of this kind of information to a majority of farmers hinders them from choosing what technologies to apply for production. Other types of information such as information on collective marketing, livestock selling prices, information on crop management scored small percentages, which indicated that they are not easily accessible to the farmers (Table 5).

#### 4.5.2 Farmer ranking of most important type information for farmers

The market selling prices of produce were ranked first in the order of importance followed by information on weather and where to sell produce was ranked third. Information on credit was ranked fourth and information on where to buy inputs (fertilizers, seeds, and pesticide) was ranked fifth. Information on how to identify other potential crops most lowly ranked (Table 6).

**Table 6. Rank for the most important type information for farmers**

Type of information	Frequency per rank order			Total weighting
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	
Where to sell your productions	50	53	33	289
What are the selling prices in the market	74	66	49	403
Where to buy inputs (fertilizers, seeds, etc)	17	16	21	104
Where to rent or buy agriculture equipments	8	20	18	82
Information about weather.	78	43	49	369
Crop management i.e. Pest control.	4	5	10	32
Identifying other potential products to grow	2	4	3	17
Information on collective marketing.	4	6	8	32
Information on credits	33	23	45	190
Where to sell your live stock products	22	15	9	105
Livestock selling price	20	15	9	99

Based on weighting of 3 for 1<sup>st</sup> rank order, 2 for 2<sup>nd</sup>, 1 for 3<sup>rd</sup> rank order

This trend is due the fact that in agricultural marketing transactions the party with more knowledge usually but not always set the initial price (Shepherd, 1997). Thus receiving timely and accurate market price information will have some impact on the livelihoods of farmers by strengthening their negotiating position for better prices in the local markets. This kind of information assists farmers to decide to transport their produce to alternative markets which provide higher prices or to store the produce and wait for off seasonal higher price.

production is capital intensive. Since most of small farmers have low own financial capabilities, agricultural credit is necessary to facilitate input purchases and technology adoption (IFAD, 1999; IFAD, 2001).

#### **4.5.3 Farmer's perception regarding quality of information received**

When farmers were asked to evaluate the information they receive from various sources in terms of understandability and accuracy. They assessed the type of information they receive with positive attributes. Table 7 summaries the responses from the farmers, where information on where to sell their agricultural produce had the highest score (51.8%). Farmers considered the information easy to understand and use. This may be due to the fact that, in the study area, maize is currently produced as a dual purpose crop that is majority of farmers depends on maize production for food and income. Also Kibaigwa market is located within the area and is a largest maize market and sometimes referred to as international maize market, the majority of farmers sell their produce there (Table 4). It is easy to gather information on this local market because farmer visits it regularly to buy other consumer goods.

Also respondents (50%) reported that information on how to better use water in their respective villages is clear and of good quality such that it is easy to understand. Water is a big problem in study area, even for domestic purposes, and people are constantly looking for way to overcome the problem. Scores against other types of information are as shown in Table 7.

**Table 7. Farmer's perception on quality of information they receive**

Type of Information	Quality of information				
	N	Clear and good quality	Clear but bad quality	Not clear and bad quality	Don't know
Where to sell	255	132 (51.8)	94 (36.8)	26 (10.2)	3(1.2)
Market selling price	258	124 (48.1)	94 (36.4)	35 (13.5)	5(1.9)
Where to buy inputs	120	54 (45)	46 (38.3)	13 (10.8)	7(5.8)
Where to rent, buy agric. equipment	136	60 (44.1)	55(40.4)	15 (11)	9(6.6)
Information about weather	224	84 (37.5)	91 (40.6)	43 (19.2)	6 (2.6)
Crop management i.e. pest control	68	24 (35.3)	15 (22.0)	20 (29.4)	9(13.2)
Information on collective marketing	47	21(44.7)	12(25.5)	4 (8.5)	10(21.3)
How to request for credits	163	75(46)	46(28.2)	32 (19.6)	10(6.1)
Where to sell livestock products	68	26(33.8)	23(33.8)	12 (17.6)	8(11.7)
Livestock selling price	66	24 (36.3)	23(34.8)	12(18.2)	7(10.6)

#### 4.6 Sources of information for farmers

##### 4.6.1 Sources of information on where to sell agricultural produce

According to Robbins (1998), farmers need to be able to compare local market conditions with those far away; price difference across grades of a product, and another and they need information on individual traders' track records so that they can avoid the untrustworthy. Results in Table 8 indicate that 70.2% of respondents obtain information on where to sell their agricultural produce from family members, neighbours and friends, followed by paying direct visits to the market places (10.9%).

**Table 8. Farmers source of information on where to sell**

Source of information	First ranked	Second ranked
Friend and Neighbors	179(70.2)	66(32.5)
Government sources	5 (2.0)	6 (2.9)
Radio	19 (7.5)	34 (16.8)
On traveling	3 (1.2)	19 (9.3)
Telephone	6 (2.4)	4 (1.9)
Buyers	15 (5.9)	21 (10.4)
Visit the market	28 (10.9)	53 (26.2)
<b>Total</b>	<b>255 (100)</b>	<b>203 (100)</b>

As mentioned earlier, the presence of the market infrastructure in the area allows farmers to visit the market place and the same helps the spread of information around the nearby villages. Other sources were reported with insignificant percentages as follows, radio (7.5%), government sources (2%), through buyers (5.9%), on travelling (1.2%). Mobile phones were an insignificant source of information, since access to them is almost none. There is no mobile phone service in the study villages.

#### **4.6.2 Sources of price information**

After liberalization of the agricultural marketing system, the price of various agricultural products is supposed to be determined by forces of the market (supply and demand). Therefore, currently there is no direct control by the government of crop prices or their pricing mechanism. Survey results showed that farmers received price information through various sources as depicted in Table 9.

Majority of sample farmers (64.1%), obtain price information from family members, neighbors and friends and follow up by checking with buyers trading in the area (38.3%). About (9.7%) of the sample farmers obtain their information through telephone. Few farmers (6.2%) were aware of the price information broadcasted by the state Radio Tanzania Dar-es-salaam (RTD). This is contrary to the findings of the Ministry of Cooperative and Marketing (2004) which reported that awareness of marketing information disseminated by government through media was higher (76.6%) than other sources (23.6%). Other sources mentioned by few respondents include personal visits to the market (4.6%) and from government sources such as extension agents (2.3%).

**Table 9. Farmers sources of price information**

Source of information	First ranked	Second ranked
Friend and Neighbors	166(64.1)	72 (36.5)
Government sources	6 (2.3)	6 (2.7)
Radio	16 (6.2)	28 (13.1)
Telephone	25 (9.7)	19 (8.8)
Buyers	34(13.1)	82 (38.3)
Visit the market	12 (4.6)	7(3.3)
<b>Total</b>	<b>259(100.0)</b>	<b>214(100.0)</b>

These results indicate that that farmers depend mainly from informal sources such as friend, neighbors and traders/middlemen's for market information. This is perhaps due to the unreliability of the information obtained from the mass media or because of lack of sensitization of most market participants to make use of mass media. There is low dependency on radio as a source of information, probably because of lack of awareness amongst farmers of the existence or importance of the programme, which announces prices of various agricultural produce. Therefore, it can be established that farmers lack market information from outside their locations. This is suggested by the low percentage (6.2%) of those who rely on radio as a main source of price information.

The majority of farmers depend on direct contact with fellow farmers or traders and middlemen's within or adjacent villages. As a result, farmers sell their produce whenever there is a price increase in the market without any knowledge about prices in other places. Consequently, farmers may sell their crop at lower prices compared to other places as reported by similar other studies, for example Nkuba *et al.* (1995).

However, observations in the newly built market infrastructure revealed that the management is providing market information using a price board inside the market

**Table 10. Farmers source of information on weather**

Source of information	First ranked	Second ranked
Friend and Neighbors	44 (19.6)	95 (55.3)
Government sources	7 (3.1)	12 (6.9)
Television	5 (2.2)	12 (6.9)
Radio	169 (75.1)	46 (26.7)
Newspapers	0 (0)	7 (4.2)
<b>Total</b>	<b>225 (100)</b>	<b>172 (100)</b>

Amongst other things, the national radio, Radio Tanzania Dar es salaam has a program aiming at informing the rural population about agriculture and about daily weather forecasts. The main advantage is the large coverage that the national radio station can achieve. Listeners are used to the programme and schedules of the national radio, particularly on weather which is broadcasted at night when most farmers are at home. Farmers prefer to tune to this station despite the existence of new broadcasting stations.

The use of printed media has played an important role in dissemination of agricultural information. Often, information is disseminated through newspapers and newsletters, but in this survey area they were reported in small percentages. The distribution of newspapers outside major towns is generally poor. This means that newspapers are unlikely to be of use to disseminate up to date market information and other agricultural information to the population in rural areas (Robbins and Ferris, 1999). Key problems with printed media include recipients' low level of literacy and language barrier challenges. Other constraints with printed media, such as newspapers, are the affordability and delays of such papers in reaching remote villages.

#### 4.6.4 Source credit information for farmers

Results in Table 11 shows that a majority of respondents, (62.1%), ranked the local financial cooperative society as the first important source for credit information, followed by friends and neighbors (29.2%), government sources (6.8%) and lastly NGO's (1.9%). The reason for this trend is that credit services are needed by farmers to enable them purchase inputs and pay for additional labour requirements. In addition the existence of Kibaigwa financial savings and credit cooperative society (KIFASCO), which operates in the area, helps as a source of information on credit. The cooperative society announces to its members, on annual basis the availability, and conditions of accessing credit to its members.

**Table 11. Source of credit for information farmers**

Source of information	First ranked	Second ranked
Friend and Neighbors	47 (29.2)	56 (50.0)
Government sources	11 (6.8)	7 (6.3)
Cooperatives	100 (62.1)	44 (39.3)
NGO's	3 (1.9)	5 (4.4)
<b>Total</b>	<b>161 (100.0)</b>	<b>112 (100.0)</b>

#### 4.6.5 Source information regarding agricultural equipments

Table 12 presents the results of farmer's sources of information on where to rent or buy agriculture equipment. Eight percent of farmers reported to be receiving this kind of information from friends and neighbors. Private firms operating in the area were ranked second whereby 71.3% of respondents obtain information from them. In the study area, farmers rent tractors from owners who render their services mainly for ploughing fields. Given the large cultivated areas, and a need to ensure timely farm operations, farmers hire tractors for ploughing. Farmers also rent ox-cats from owners to transport their produce to the market. Farmers obtain information on where to rent tractors and ox-cats from fellow farmers.

**Table 12. Sources of information regarding agricultural equipments**

Source of information	First rank	Second rank
Friend and Neighbors	110 (80.4)	24 (27.6)
Government sources	3 (2.2)	1 (1.1)
Private firms	24 (17.4)	62 (71.3)
<b>Total</b>	<b>136 (100)</b>	<b>87 (100)</b>

#### 4.6.6 Sources of information on where to buy agricultural inputs

Supply of agricultural inputs such as fertilizer, seed and chemicals, is among the major constraints in Tanzania's farming sector. Furthermore, following the reforms in the agricultural sector, subsidies on inputs have been stopped and the sector is now open to market forces. The subsidy policy was effective because the government had a monopoly in inputs supply. Table 13 presents the result regarding farmers' sources of information on where to buy inputs. Where 62.8% of the respondents reported that friends and neighbors are the most important source of information, followed by radio advertisements, (16.1%).

Absence of reliable source of information on input place farmers on disadvantage side because farmers will be unable to buy inputs on time and farmers will not able to identify retailers who offer most competitive input prices. This finding is supported with the findings by Janowski *et al.* (2003) in Uganda who found that about 70% of farmers in Lira District owned a radio, and that in most cases it was working, and that radio was the second main source of information on sources of inputs after neighbors and relatives. Twenty nine percent of farmers ranked the procedure of personal visits to the agrochemical shops to check on prices of inputs as the second important source of information on where to purchase agricultural inputs.

**Table 13. Source of information on where to buy inputs for farmers**

<b>Source of information</b>	<b>First Rank</b>	<b>Second Rank</b>
Friend and Neighbors	74 (62.8)	19 (27.5)
Government sources	14 ( 11.9)	14 (20.3)
Radio	19 (16.1)	14 (20.3)
On traveling	3 (2.5)	2 (2.9)
Visits to the market	8 (6.7)	20 (29.0)
<b>Total</b>	<b>118 (100.0)</b>	<b>69 (100.0)</b>

#### **4.7 Frequency of delivering market information**

##### **4.7.1 Frequency in which farmers obtain information**

During the survey, it was identified that market information, that is information on where to sell and market selling price are the type of information which are received more frequently by farmers (reported by more than 80%) as show in Table 14. As it has been mentioned earlier, information is reaching farmers trough friends and neighbors, after visiting the market place. Results also show that 81.4% of farmers in the study area receive information on weather each week. The major source of this type of information is the radio, and the respondents, reports to be to listening to the radio frequently.

About 44% of respondents reported to obtain information on where to rent or buy agriculture equipments annually. In the study area, the rainfed production system limits the cultivation and harvesting period to restrict few months of the year. During this period, farmers are in need of information on where they can rent tractors, ox-carts etc. This trend has also been reported for information on credit by 37.3% of the respondents. The SACCOS operating in the area announces to its members, annually, the availability of credit.

The results also indicate that 39.7% of the respondents obtain information on how to manage their crop production i.e. how to manage pests, fertilizer application etc rarely, as indicated in Table 14. This type of information is supposed to be provided by extension offices, but in most cases the extension service is ineffective. Other type of information reported to be received very infrequent as indicated in table 14. The reason is that farmers obtain their most valuable information via informal information systems around them and the like. Unfortunately information from such systems can be inaccurate, outdated and is often incomplete.

**Table 14. Frequency at which farmers obtain various information**

Information for Agriculture	Each week	Each month	Each six months	Annually	Rarely	Don't know
Where to sell	212(84.8)	28(11.2)	2(0.8)	4(1.6)	1(.4)	2(.8)
Market selling price	206(81.8)	35(13.9)	2(.8)	5(2.0)	1(.4)	2(.8)
Where to buy inputs	45(38.8)	16(13.8)	9(7.7)	31(26.7)	14(12.1)	1(.9)
What to grow	21(29.2)	11(15.3)	10(13.9)	18(25.0)	4(5.6)	4(5.6)
Place to rent or buy agr. Equip	30(22.9)	18(13.8)	14(10.7)	58(44.3)	9(6.9)	2(1.5)
Information on weather.	178(81.4)	16(7.3)	1(0.5)	7(3.2)	13(5.9)	4(1.8)
Crop management	15(27.6)	6(10.3)	4(6.9)	7(12.1)	23(39.7)	2(3.4)
Information on credit	37(23.0)	25(15.5)	13(8.1)	60(37.3)	18(11.2)	7(4.3)
Where to sell livestock	22(33.8)	21(32.3)	2(3.1)	1(1.5)	15(23.1)	2(3.1)
Livestock market price	20(32.8)	21(34.4)	1(1.6)	1(1.6)	14(23.0)	2(3.3)

#### 4.7.2 Frequency at which farmer prefers to obtain information

Most farmers would prefer to access market information weekly, i.e. information on where to sell, market selling price (91.0%), where to sell livestock/products (51.8%), market selling price of livestock (57.3%) and where to buy inputs (30.2%), (Table 15). Also, respondents (85.9%) prefer to obtain weather information once a week, 31.2% of respondents reported to prefer to receive information credit in each six month, and 36.1% of respondents would prefer to receive information on how to

manage their production on a monthly basis. The explanation for this kind of behavior is that, price information offered to farmers on wider intervals can not be very useful. Market prices change significantly within short periods, some times even in a single day. Moreover, prices are likely to become more volatile as local and regional markets are more interconnected and further liberalized. Thus the provision of this kind of information on longer time intervals would not be helpful. Farmers preferred to receive weather information weekly because, in the area, people depend entirely on the weather for their agricultural activities, especially the availability of rains. Updated and accurate weather information enables them to plan their production activities well.

Only 36.1% of respondents prefer to receive information on crop management within each month. This kind of information is provided by the public extension services, but in many cases extension services do not work effectively, and in many instances they have collapsed (Njuki, *et al.*, 2004). As a result, farmers rarely obtain the extension services in form of training on crop production.

**Table 15. Frequency at which farmers want to obtain various information**

Type of information	Each week	Each Month	Each six month	Annually	Rarely	Don't know
Where to sell	225(89.7)	23(9.2)	0(.0)	0(.0)	1(.4)	1(.4)
Market selling price	234(91.0)	21(8.2)	0(0)	0(0)	1(.4)	0(.0)
Where to buy inputs	55(30.2)	56(30.7)	27(14.8)	43(23.6)	1(.5)	0(.0)
Place to rent or buy agricultural equipment	45(23.1)	57(29.3)	43(22.1)	48(24.6)	1(.5)	1(.5)
Weather information.	207(85.9)	25(10.3)	1(.4)	7(2.9)	0(.0)	0(.0)
Crop management	35(19.3)	66(36.1)	36(19.9)	43(23.8)	1(.6)	0(.0)
Information on credit	59(26.7)	59(26.7)	69(31.2)	32(14.5)	2(.9)	0(.0)
Where to sell livestock	73(51.8)	41(33.6)	3(2.4)	2(1.6)	3(2.5)	0(.0)
Livestock selling price	67(57.3)	43(36.8)	4(3.5)	1(.9)	2(1.7)	0(.0)

#### **4.8 Information requirements as expressed by farmers**

Table 16, presents results of respondent's requirements for more of different types of information; 78.8% of respondents require more information on weather, 74.1% of respondents needs more information on market selling prices. Seventy three percent requires more information on credits and 68.8% of respondents need more information on where to sell their produces. These are the topics were households expressed more information requirements than others.

Other themes which respondents reported to require more information includes; crop management i.e. pest management, weeding etc. where 57.2% of respondents indicate so, 56% of respondents need more information on where to rent or buy agricultural equipments. Forty nine percent of respondents require more information on collective marketing and group formation on how to organize with other producers to improve sells conditions. For other types of information less than 50% of respondents mentioned to require more information about them.

This situation suggests that there is a demand for a wide range of information in the study area. This is because, presently there is need for farmers to shift from production based agriculture to market oriented agriculture, and quite often farmers have to make decisions about what, where and when to market their produce. There is increased need for information. The need for more information is due to the reason that specific markets requires considerable investments and in order to recoup cost for activities such as improved cultivation technologies, farmers need to be able to plan their investments and inputs based on known market prices and conditions.

However the findings of this study showed that the current information practices within the survey area is overwhelmingly informal in nature and offer very limited information to satisfy farmer's needs.

**Table 16. Respondent's need for the amount of information**

Type of information	Need more information	Need little information	Doesn't need more information	Don't know
Where to sell	185(68.8)	55(20.4)	27(10)	2(.7)
Market selling price	200(74.1)	48(17.8)	21(7.8)	0(0)
Where to buy inputs	103(49.3)	62(29.7)	35(16.7)	8(3.8)
What to grow	81(43.8)	45(24.3)	49(26.5)	8(4.3)
Place to rent or buy agr. Equipments.	117(56.5)	59(28.5)	28(13.5)	3(1.4)
Information about weather.	204(78.8)	27(10.4)	25(9.7)	3(1.2)
Crop management	111(57.2)	59(30.4)	12(6.2)	12(6.2)
Collective marketing actions.	85(49.7)	32(18.7)	35(20.5)	19(11.1)
Information on credits	173(73.3)	39(16.5)	19(8.1)	5(2.1)
Where to sell Livestock.	65(35.1)	46(24.9)	56(30.3)	18(9.7)
Livestock selling price	69(37.9)	39(21.4)	57(31.3)	17(9.3)

#### **4.9 Effects of market information on farmers decisions to sell maize**

For a better understanding of the marketing system in the study area, and the effect of market information on decision of farmers to market their maize produce, the study presents different channels that are selected by farmers in disposing their maize produce, and the reasons for selecting either of them.

##### **4.9.1 Maize marketing channels**

It is argued by Ashimongo (1994) that if market channels are efficient, they will induce farmers to become more commercialized. This is because access to efficient markets serves as an incentive for farmers to specialize in production of certain crops, often such crops have a comparative advantage in the region. To understand

how maize moves through various channels, it is necessary to identify various market places where maize marketing takes place.

**Table 17. Maize produce outlets**

Outlet	Number of transactions	Percentages
Local market	191	35.3
Wholesale market	143	26.4
Farmgate sell	180	33.3
<b>Total</b>	<b>541</b>	<b>100</b>

Maize sales by sample farmers took place mainly in three outlets, 37.2% of maize sales occur in the local market, 35% of sales occur at the farmgate and 27.8% of sales occurred at Kibaigwa whole sale market (Table 4. 17). The distribution of outlets is almost equally distributed, which suggests that there are other factors other than price which influence farmers' choices of market outlet.

#### **4.9.2 Factors influencing farmers' choices of market outlets**

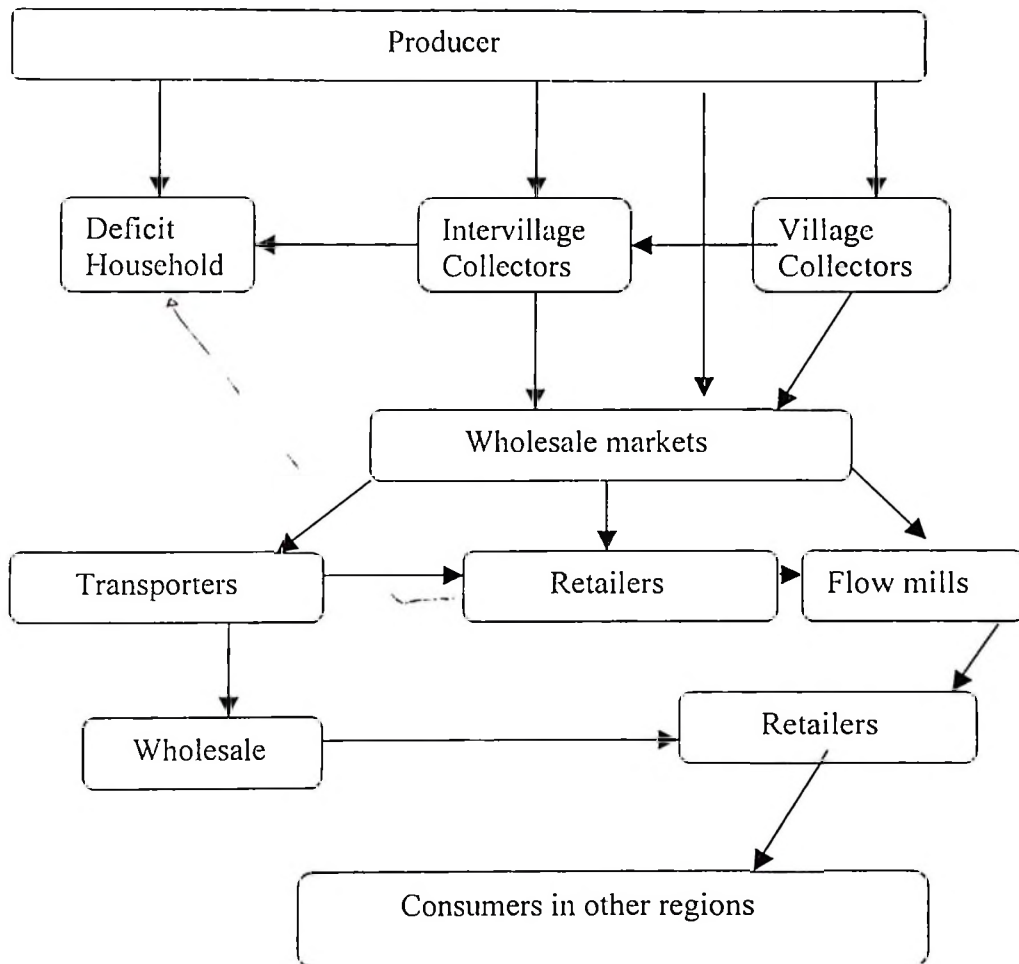
The decision of a farmer to choose a certain outlet is affected by several factors as indicated in Table 18. A low volume of production is the most constraining factor as it limits distant trading and it was mentioned by 32.3% of farming households. These farmers marketed their produce at home. About fourteen percent of respondents who sold their produce at home mentioned that they did so to avoid transportation cost. The volumes traded were low and turnovers would not be able to accommodate transportation costs.

**Table 18. Farmers justification for using various market outlets**

Reasons	Home		Local market		Wholesale	
	No.	%	No.	%	No.	%
Lucrative price	30	22.5	39	22.5	48	38.1
Room for price bargain	9	6.8	26	14.9	22	17.4
Certainty of price	9	6.8	42	24.1	5	4.0
Lack of alternative	23	17.3	52	29.9	43	34.1
Low volume of production	43	32.3	8	4.6	7	5.6
Minimizing transport cost	19	14.3	7	4.0	1	0.8
<b>Total</b>	<b>133</b>	<b>100.0</b>	<b>174</b>	<b>100.0</b>	<b>126</b>	<b>100.0</b>

Farmers who sold at the wholesale market, (38.1%), mentioned lucrative prices they got at the market as the reason for choosing this outlet, 34.1% of farmers reported that they lack alternative way to sell their produce except to sell to the at the Kibaigwa wholesale market (Table 18). Farmers who sold at the local market mentioned several reasons such as lucrative prices (22.4%) and assurance to be paid the agreed price (24.1%). Thirty percent of the respondents mentioned that they lack alternative place to sell their produce (tied sales). Farmers, who report to sell their produce in the local market, bring their produce to the wholesale market but transact outside the market infrastructure so as to avoid the market fee. Ignorance of using weighing machines was an additional impediment.

Following market liberalization, farmers every where in Tanzania are free to sell their produce to any village-based middlemen or directly to traders in the whole sale markets. In Kongwa district maize trade is dominated by the private sector. Private traders are the only outlets easily accessible by the smallholder producers.



**Figure 3 Maize marketing channels in the study area**

Figure 3 Illustrates how the various marketing agents are linked to form the network of marketing channels for maize in Kongwa. As noted above, in Kongwa maize grains are sold through a narrow variety of outlets. The marketing system involves less significant channels in the sense that there is little activity outside the private traders. This reflects a possible greater influence of traders on price formation and may lead to high market margins between different market nodes.

### 4.9.3 Factors influencing farmer's decision to sell their maize produce

Market availability for farm produce is an incentive to farmers to grow commercially. In turn, production for the market has the potential for increasing farmer's income. However, the level of income to be accrued by farmers depends highly on the price at which they sell their produce. Market information is an important factor that can influence farmer's decision to sell maize. However, in the study area, there are other important factors that influence farmers to sell maize as indicated in Table 18.

**Table 19. Time at which farmers sell maize produce**

<b>Time of sell</b>	<b>Number of respondent</b>	<b>Percentage</b>
Immediately after harvest	152	58.2
Wait for a higher price	83	31.8
Already had a deal before harvest	2	0.8
I sell when I need cash	24	9.2
<b>Total</b>	<b>261</b>	<b>100</b>

Only 31.1% of respondents waited for the price of maize to rise before they sell their maize. Fifty eight percent of respondents sell some of the maize immediately after harvest and keep the remaining for the price to rise. In theory, market information should enable farmers to negotiate with traders, plan production more in line with market demand and schedule deliveries to the market at times when returns are high (Shepherd, 1997). In this case the market information, which farmers have, does not follow this argument. Despite the full knowledge of price by 91.5% of respondents (Table 9) the majority of farmers sell their maize immediately after harvest, when prices are at the lowest (Table 19).

These findings are supported by findings by James and Lazaro (1999). In their study of Maize marketing in the same study area, they found that only 23% of respondents in Kibaigwa village sold their maize in March when the prices were highest. There are two possible explanations for this. First, large farmers are forced by the lack of storage facilities to part with much of their surplus during the harvest period when prices are low. Second, social economic activities of the farmers such as repayment of services provided on credit, mainly tractor services for ploughing, meeting other cash demands for the family and lack of alternative income generating activities. These factors force farmers to dispose their produce immediately after harvesting. About 9.2% of respondents reported that they sell their maize produce when they come across a problem which needs cash to be solved. Others would keep their maize and sell it just before the start of a new season to obtain cash for the operation of a new season.

#### **4.9.4 Market transparency**

Market transparency affects the intensity of competition. If buyers or sellers do not have proper knowledge about market conditions, the intensity of competition is low despite a sufficient number of market participants. The most important aspect of market transparency is information transmission in the marketing system. This implies that information about prices, grades and standards weight of the product in question are available to any market participant. In the study area the preconditions for high degree of market transparency are poor. There is no uniform measurement, weights or standards and grades. Sellers and buyers at the market use many different measuring devices such as weighing machines for farmers who sell inside the

Factors with positive and significant influence are the level of education of the respondent and the size of the farm owned by the respondent. The positive relationship between WTP and education can be explained as follows. The higher the level of education the increased ability to process and constructively use the information. Individuals who seek out information as a result of increased level of understanding of different forms of information because of better education. Farm size related positively to WTP because the owners of large farms would usually have higher capital investments and this would entice such owners to look for external sources of information to guide them in their decision-making processes.

On the other hand, age and amount of money one is willing to pay for market information (payment bid) have negative effects and they are insignificant. The negative relationship between WTP and age is base on the fact that older people tend to be risk averse and would not like to incur new costs. In addition, older people may find it difficult to understand the operations of institutions which are provides information. The amount of money one is willing to pay for market information (payment bid) and WPT has a negative relationship due to the fact that propensity to pay decreases with increase in price. This is consistence with the findings by Rose (2005) that the decrease in the proportion of respondents saying yes to WTP as the price increases. Theoretically, the proportion that WTP will approach 100% as the bid payment approaches zero and will approach 0% as the bid payment becomes larger.

WTP analysis does indicate that there is a relationship between the WTP and two of the social economic-variables, namely education and farm size. Therefore, there is an indication of existing demand for improved market information especially by relatively bigger farmers and more educated farmers.

**Table 20. Results of the regression analysis**

Variables	Coefficients	Std. error	Wald	Significance
Constant	-0.662	0.747	0.785	0.376
Distance to the market	0.013	0.015	0.798	0.372
Payment bid	-0.001	0.010	1.190	0.275
Age	-0.005	0.012	0.201	0.654
Education (Years in school)	0.222	0.051	18.944**	0.000
Farm size	0.012	0.005	7.226*	0.007
Place of sale	0.139	0.282	0.243	0.622

\*\* = significant at  $p < 0.001$  and \* = significant at  $p < 0.01$

#### 4.11 Farmers response to improved market infrastructure at Kibaigwa

During 2002, the Tanzania Farmers Network locally known as *Mtandao wa Vikundi vya Wakulima Tanzania* (MVIWATA) initiated a project focused on improvement of rural markets (RMDP) in Morogoro and Kongwa districts with the support from the French Development Agency (AFD). This project built a market at Kibaigwa village, which is the largest maize market in the country, with more advanced facilities and capacity. Maize is the single crop marketed at this market, although small quantities of groundnuts and sunflower are also traded.

The construction of the market was intended at increasing access to market information, empowering smallholder farmers, improving the crop quality, ensuring security and easy payment procedures. Various agents operate at the market: farmers, traders, middlemen, porters, packagers, transporters brokers, tax collectors, petty

business operators and market cleaners. Currently, the market offers a wide range of services ranging from weighing and measure, cleaning, temporary storage, security, market linkage and market information services.

Market information is provided on the price board in the market premises near the weighing machine. The purpose being to help farmers to view the prices easily on the price board, when measuring their produce. Nonetheless smallholder farmers are still disorganized and lowly educated on the importance of weighing and selling their produce in standard measures such as kilograms as advised on price board. As a result middlemen, merchants and bulking groups are taking advantage of these and trade in tins as a unit of measurement. There is also the problem of taxation and market fees by the local administration. The local governments acts of collecting taxes, chases away smallholders from selling their produce at the market. They in turn opt to sell their maize produce outside the market.

#### **4.12 Institutional and policy constraints**

Improving institutional organizational arrangements can solve some of the problems experienced by market participants in accessing market information. Such institutions include co-operatives, collective marketing, contract farming, credit provision and improved extension services. However, findings from this study show that the capacity and willingness amongst farmers to cooperate is very limited. For example, out of all studied farmers in the study area, only 39.7 % were members of a local cooperative financial society, only 2 farmers (0.7) were producing under contract farming, and only 15.1% had contacts with extension services for the past

twelve months (Table 21). About 92.6% of respondents in the area reported that they were not members of any organization because they were not aware of their existence (Table 21). Also, 84.2% of all respondents reported that they had never teamed up with other producers in transportation of their produce to the market.

**Table 21. Farmers access to market support institutions**

<b>Institution</b>	<b>Counts</b>	<b>With access</b>	<b>With no access</b>
Credit	266	107(39.7)	199(60.3)
Contract farming	283	2 (0.7)	281(99.3)
Cooperatives	274	21(7.4)	253(92.6)
Access to extension	272	41(15.1)	231(84.9)

Poor and low levels of cooperation amongst farmers results in failure to effect joint marketing and seeking extension services to an extent explains why respondents have few sources of information. It is worth noting that apart from assisting market participants to access information, associations would have also made it easier for them to acquire other services such as credit. IFPRI, (2003) reported that although institutions can play a better role in linking farmers to markets, there is an emerging consensus that governments also have a significant role in closing the access gap. Governments can play a facilitating role in helping institutions and forms of collective action that will effectively reduce transaction costs of market entry and participation by smallholders.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Overview

The major objective of this study was to assess the relevance of the current agricultural market information available to farmers for increasing efficiency and effectiveness in agricultural commodity market exchange. Also to establish farmers' willingness and ability to access better information from a mix of alternatives sources. Specifically the study is intended: (i) to identify the type of market information needed by farmers in the study area, (ii) to identify sources of information used by farmers, (iii) to assess the type and frequency of delivering market information preferred, (iv) to carry out contingency analysis on farmers willingness to pay for market information. This chapter presents answers to each of research questions, conclusions and recommendations emanating from the major findings of the study.

#### 5.2 Conclusions

##### 5.2.1 Types and sources of information available to farmers

In an attempt to identify the types of information available to farmers, it was found that farmers were aware of information on where to sell their produce, selling prices, information about weather conditions, information on where to obtain credit, and information on where to rent agricultural equipments. The study found that the use of conventional sources of market information such as television, radio, newspapers, internet, telephones and extension services is low. This means that the current

information practices within the area is overwhelmingly informal in nature and offer very limited information to satisfy farmers' needs.

### **5.2.2 Frequency of delivering market information**

During the survey, it was identified that market information, that is information on where to sell and market selling price are the type of information which are received more frequently by farmers (reported by more than 80%). This type of information is reaching farmers through friends and neighbors, after visiting the market place. Thus the cost of accessing market information is relatively low due to proximity.

Farmers would prefer to access market information weekly on the following themes; information on where to sell, market selling price, where to sell live stock/products, and where to buy inputs. About 85.9% of all respondents prefer to obtain weather information once in each week. Thirty one percent of respondents reported to prefer to receive information on credits in each six month, while 36.1% of respondents would prefer to receive information on crop management in each month. All these results underline the need for taking initiative to improve the delivery of market information services in the study area and country as a whole.

### **5.2.3 Farmers willingness to pay for market information**

In an attempt to establish farmers WTP for desired information sources, it was hypothesized that farmer's willingness to pay exceeds the cost of provision of market information. The null hypothesis was rejected because it was found that there is a negative relationship between willingness to pay and cost of providing information,

this is due to the fact that the propensity to pay decreases with an increase in price. Furthermore the WTP analysis did indicate that there is a relationship between willingness to pay and two of the socio-economic variables, namely education and farm size. This shows that there exists demand for improved market information delivery especially by the relatively bigger farmers and the more educated ones.

#### **5.2.4 Effects of market information on decision to sell maize**

Despite the full knowledge of price, by 91.5% of respondents, the majority of the farmers sell their maize immediately after harvesting when prices are at the lowest. Furthermore, 58.2% of the respondents sell some of their maize immediately after harvest and keep the remaining for the price to rise. Only 31.1% of respondents waited for the price of maize to rise before they sell their maize. This means that there are other factors other than market information, which influence farmers' decision to sell their produce. Thus any decision to develop the market information service, first step is to understand the marketing system for the products to be covered.

The study found that there are several outlets for the farmers produce. These are selling at home, selling at the wholesale market and selling at the local assembly market(s). Factors that were found to affect farmer's decision of which market outlet to use include: Low volumes of production leading to household simply selling at home steads. Farmers who sold at the whole market mentioned higher prices they got from sales at this market as the reason for choosing this outlet. They also mentioned that they had no other option to sell their produce. Farmers who sold at the local

market mentioned several reasons such as higher prices and assurance to be paid the agreed price as the key reason leading them to use this outlet.

### **5.3 Recommendations**

Based on the findings of the study the following recommendations are made with the aim of improving access to market information for smallholder farmers.

#### **5.3.1 Localization of market information**

The study found that those farmers are selling mainly to local retail or assembly markets and obtain their most valuable information via informal information systems around them and the like. Market information provided nationally by the radio Tanzania is not easily accessible to farmers as the transmissions of the national radio not good in other places. Furthermore, many farmers are not aware of the existence of the market information programme in the national radio. The study thus recommends the department responsible for collecting and disseminating market information, to make use of local radio stations to take advantage of the growing number of local FM radio stations to broadcast market information appropriate for particular locality.

#### **5.3.2 Promotion of market information need**

The aim of any market information services is to increase the knowledge and awareness of market prices and supply conditions for all market participants, i.e. producers, wholesalers, retailers, and consumers. The study found that farmers in the study area lack information from outside their localities. This study recommends that

farmers need to be made aware of their right to information, how they can use it, and how to influence its delivery. Well targeted campaigns could be useful in order to stimulate the interest of the general public to access and use market information published or provided through mass media.

### **5.3.3 Improving means of delivering market information**

The study found that government provision of market information has little impact on type of information received by farmers. Deliberate efforts to improve the situation ought to be directed to make dissemination programs listener friendly and attractive. The study recommends that timing of radio programs is crucial to ensure that when the programs are in the air, many farmers would be listening and enhance chances for greater impact.

### **5.3.4 Facilitation of knowledge and information transfer**

As a first step, there is a need to identify information generation points, mechanisms for effective information flow and the exact users' needs as far as for effective and efficient market information is concerned. Extension workers are in direct contact with farmers, and are in a position to offer advice and support both in technical production matters as well as marketing matters. It is therefore important for the MIS to utilize extension services for the dissemination of market data and to inform farmers on how to use the market data to help with their marketing decisions. The government could encourage the participation of private sector and NGOs in providing market- relevant technical training for producers.

### **5.3.5 Institutional support**

The study found that institutional support, such as provision of training and extension services on agricultural production and marketing were not adequate in the study area. Smallholder organizations and cooperatives are missing in the area. The study thus recommends for an increase in the provision of training and extension services on the establishment of smallholder cooperatives, and associations that would empower smallholder farmers and improve access to market information. These organizations assist farmers to organize themselves for purpose of bulking and marketing their produce together. This will enable them generate sufficient critical mass and their bargaining power will increase substantially.

Even though the information provided by the MIS should be of benefit to farmers, traders, government officials and policymakers and consumers, the service from the start should determine that farmers are to be given priority. This will ensure that the right decisions are made regarding what data is to be collected, what markets are to be covered, and how and when the information is disseminated.

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## APPENDIX

### Appendix 1. Farmers Questionnaire

#### Section 1. Basic Characteristics of the Farmer:

Name of the Farmer:

Sex of the Farmer:

Age of the Farmer:

Highest level of school attended:

#### Section 2. Basic Characteristics of the Farm:

Location of Farm:

Size of the Farm:

Distance from Farmer's home to the farm.....

List crops grown on the farm with an indication of the size of the plot:

Name of Crop	Size of Plot
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

**Section 3.****Marketing**

1. Name of Market Used: .....
2. Market day:.....
3. What day and time do you usually leave the farm to go to market?
4. How many times do you sell this product in a year?.....
5. Why do you prefer to sell your products in the place?
  - Higher price.....1
  - You can bargain with more buyers.....2
  - You are sure you will be paid the agreed price.....3
  - You have no other option (tied sales).....4
- Other (specify).....
6. You sale your crops;
  - Immediately after harvest.....1
  - You wait for a higher price.....2
  - You already had a deal before harvest.....3
- Others.....
7. Do you usually establish written contracts with the trader/collector/firm?
  - 1 = yes, 2 = no.
8. Have you received any of these services from the trader/collector/firm buying your products?
  - Transportation.....1
  - Monetary loan.....2
  - Loan of seeds/inputs.....3

Technical assistance.....	4
Others (Specify).....	
9. In this selling your produce, do you join another producer to transport your goods?	
Always.....	1
Usually.....	2
Seldom.....	3
Never.....	4

#### Section 4 Access to MIS

1. If current market price for maize known, 1 = yes, 2 = no
2. How in advance do you know the prices in the market (days).....
3. Where do you get market price information?.....
4. Do you have access to information on a): Market selling prices b): Where to sell  
c): Where to buy input d): Where to rent agric. Equipment e): Weather f): Credit  
g): Livestock selling prices h): where to sell livestock's and their products
5. What is the quality of the information your receiving in these themes
  - a). Clear and of good quality
  - b). Clear but of bad quality
  - c). Not clear and of bad quality
  - d). Don't know
6. What is your source of this type of information? (Select two sources in order of  
priority)
  - a). Through friends, family and neighbors
  - b). Government agencies

- c). Cooperatives
- d). Farmer associations or other associations
- e). Local financial institutions
- f). Private firms (exporters, food processors etc.)
- g). NGO`s
- h). Local schools
- i), Radio
- j). Television
- k). Internet
- l). Newspaper
- n) Telephone.

7. What is the frequency do you receive these type of information

Daily.....	1
Weekly.....	2
Each Month.....	3
Each six Month.....	4
Annually.....	5
Rarely.....	6

8. With what frequency do you think the information should be provided?

Daily.....	1
Weekly.....	2
Each Month.....	3
Each six Month.....	4
Annually.....	5

Rarely.....6

9. With respect to these themes of information do you need?

A lot more of information.....1

Need a little more of information .....2

Does not need more information.....3

Do not know.....4

10. Of all these themes which do you consider the most important? (The prioritization is independent of for each group of themes)

Theme	First rank	Second rank	Third rank
Market selling prices			
Where to sell			
Where to buy input			
Where to rent agric. Equipment			
Weather information			
Credit information			

11. Have you heard of the Market News Service (Yes/No?)

If yes:

Why do you not use the Market News Service?

- Timing of the broadcast is not convenient
- Information not understandable
- Information not useful
- Other (describe)

12. What newspapers you read?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Have you ever read any market information articles?

**Section 5. Support Institutions**

1. Which is your most important source for loans?

- Commerce (inputs salesmen).....1
- Buyer of production.....2
- Private bank.....3
- SACCOS.....4
- Microfinance Institution.....5
- NGO.....6
- Family/friend.....7
- Government entity.....8
- None of the above.....9
- Others.....88

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

1= yes, 2=no

3. Number of time receive technical assistance in the last 12 months

4. If household has contract or informal agreement with a buyer concerning the sale of an agricultural product 1=yes, 2=no

5. If household have ever belong to a cooperative concerning the sale of an agricultural product 1=yes, 2=no

**Section 6. Willingness to pay**

Knowing the potential benefits access to information might bring to you (better prices from traders, knowledge of where to sale, knowledge of how to mange your production, knowledge on weather etc.) will you be willing to pay: Tsh..... Per month. Yes..... No.....

CPZ