COMMUNICATION MEDIA PREFERENCES BY RURAL COMMUNITIES FOR ACQUISITION OF AGRICULTURAL INFORMATION IN MVOMERO AND KILOSA DISTRICTS, MOROGORO, TANZANIA

INNOCENT MATHIAS BUSINDELI

A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

2016

ABSTRACT

It has not been established yet whether or not the availability, accessibility and content of communication media and their related factors influence heteregeneous groups in their preferences for communication media for acquisition of agricultural information in rural communities in Tanzania. This study aimed at establishling preferences for communication media for acquisition of agricultural information by rural community members in Mvomero and Kilosa Districts. It comprised a sample size of 240 community members, whereby data were obtained using a semi-structured questionnaire, focus group discussions, key informant interviews, observations and document reviews. The quantitative and qualitative data were analysed using SPSS and NUD*IST Vivo (Nvivo) computer softwares respectively. Results indicated that availability and accessibility of radio influenced men, women and youths in their preference for the medium; while based on availability of agricultural information that meet their needs: Men preferred broadcast media (radio and television); women preferred booklets, while youths preferred mobile phones. In addition, acceptability of print media was influenced by readability. The study established the readability Flesch index of 54.99 for leaflets and booklets in the study area that had not been established. This means that people with low level of education in the study area had problems in understanding the content of print media. Furthermore, accessibility of leaflets and television was influenced by education level and income of community members. This is an added knowledge in the Preference Theory. Finally, the study identified organisational constraints as most influential constraints to utilisation of communication media. In conclusion, preference for communication media by rural community members is influenced by their availability, accessibility and content of

communication media. The study recommends establishing at least one farmers' resource centre per ward in rural areas to enhance availability of communication media; government intervention to reduce costs of television and its accessories for boosting usage and accessibility of television to low income earners in rural areas, and increasing funds for print media production to facilitate production of quality and readable leaflets and booklets among others.

DECLARATION

I, INNOCENT MATHIAS BUSINDELI, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is the result of my original work and has neither been submitted nor concurrently being submitted for a degree award in any other university.

…… ……

Innocent Mathias Busindeli Date
PhD Candidate

Confirmed by:

…… ……

Prof. Amon Z. Mattee Date
Supervisor

…… ……

Date

Prof. Doris S. Matovelo

Supervisor

COPYRIGHT

ACKNOWLEDGMENT

This study could not have been completed without the intervention of God, the Almighty. I thank Him abundantly for giving me good health and endurance to undertake the study.

My special gratitude is due to my supervisors Prof. Amon Z. Mattee and Prof. Doris S. Matovelo for their encouragement, guidance, constructive criticism and suggestions that led to the improvement of the quality of this thesis.

Besides, I am sincerely grateful for my sponsor, the Government of Tanzania through its Commission for Science and Technology (COSTECH) for the financial support. I also extend thanks to my employer, Sokoine University of Agriculture for granting me study leave to pursue my PhD.

I thank my classmates and workmates for their friendly attitude and encouragement in very difficult moments. The assistance of all research assistants, namely Green Kassabaje, Victor Lyawere, Achiula and Richard Paul during the survey is likewise highly appreciated.

I also extend my thanks to community members in the study villages who, despite their being busy with agriculture and livestock production, agreed to share with me their experiences and insights; to village leaders and extension staff members at the district and village levels who organised the discussions and interviews.

Similary, I give gratitudes to researchers at Agricultural Research Insitute (ARI) Ilonga, Mr. Rajab Kangile, an economist and statistician at Chollima Agro-scientific Centre, Dakawa and SUA and information providers, particularly Mtandao wa Vikundi vya Wakulima (MVIWATA), Radio Jamii Kilosa, Bustani ya Tushikamane, Kilosa Rural Services and Electronic Centre (KIRSEC) and others for their cooperation during this study.

Moreover, I am thankful to all the SUA's staff especially Prof. Christopher Mahonge and Dr. Kizito Mwajombe, also Dr. Jonas Tiboroha (from the University of Dar es Salaam) for their valuable inputs, advice and tutorials during proposal development.

Lastly, my thanks go to my wife, Rehema and my children (Michael, Agatha and Elizabeth), other family members, Pastor Fidelis Maganga and my church members for their love, prayers, patience and encouragement throughout the entire study period.

DEDICATION

I dedicate this work to my mother, Susana Mfaume for her guidance, care and constant encouragement in my life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ARIs	Agricultural Research Institutes
CFA	Centre for Farmers and Agriculture
CAR	Commission for Africa Report
COSTECH	Commission for Science and Technology
DRPGS	Directorate of Research and Post Graduate Studies
DVD	Digital Video Disc
EPINAV	Enhancing Pro-poor Innovations in Natural Resources and Agricultural Value Chains
ESRF	Economic and Social Research Foundation
FARA	The Forum for Agricultural Research in Africa
FTCs	Farmers Training Centres
FGDs	Focus Group Discussions
FADECO	Family Alliance for Development and Cooperation
FAO	Food and Agriculture Organisation of the United Nations
FOCAL	Future Opportunities and Challenges for Agricultural Learning
GIS	Geographic Information System
ICE	Institute of Continuing Education
ICTs	Information and Communication Technologies
ITU	International Telecommunications Union
KATC	Kilimanjaro Agricultural and Training Centre
KIRSEC	Kilosa Rural Services and Electronic Communication Centre
KII	Key Informant Interview

KMO	Kaiser-Meyer-Olkin
LGAs	Local Government Authorities
MAFC	Ministry of Agriculture, Food security and Cooperatives
MNLR	Multinomial Logistic Regression
MAMIS	MVIWATA Marketing and Information System
MATI	Ministry of Agriculture Training Institute
MVIWATA	*Mtandao wa Vikundi vya Wakulima Tanzania*
NALERP	National Agricultural and Livestock Extension Rehabilitation Project
NBS	National Bureau of Statistics
NGOs	Non Governmental Organisations
PANTIL	Programme for Agricultural and Natural Resources Transformation for Improved Livelihood
RE	Reading Ease
REA	Rural Electrification Authority
REPOA	Research on Poverty Alleviation
RIU	Research Into Use
R&D	Research and Development
SIMLESA	Sustainable Intensification of Maize-Legume in Eastern and Southern Africa
SMS	Short Message Service
SNAL	Sokoine National Agricultural Library
SUA	Sokoine University of Agriculture
SUA TV	Sokoine University of Agriculture Television

SPSS	Statistical Package for Social Sciences
TANESCO	Tanzania National Electricity Supply Company
TARP	Tanzania Agricultural Research Project
TCRA	Tanzania Communications Regulatory Authority
TDG	TeleComm Development Group
UMADEP	Uluguru Mountains Agricultural Development Project
UNESCO	United Nations Educational, Scientific and Cultural Organisation
URT	United Republic of Tanzania
VPA	Visual Problem Appraisal
WARCs	Ward Agricultural Resource Centres

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

In developing countries, decisions related to agricultural production requires availability and accessibility of agricultural information. Agricultural information includes a broad range of established knowledge on farming and livestock husbandry practices, post-harvesting, markets, funding, weather and climate. This information can be effectively disseminated in rural areas through communication media. These are composite devices which incorporate several channels at once (Leeuwis, 2004). They are available in print, broadcast, electronic, visual and social media formats.

Evidence from studies in Africa, Asia and Latin America have indicated that most of agricultural information has been transmitted through various formats of communication media (Rölling, 1996a; Moores, 2000; FAO, 2002; Leeuwis, 2004; Mccombs, 2004; Daku *et al*., 2005; Eden and Kalusopa, 2005; Forje, 2006; Swanson, 2006; Fawole, 2008; Lwoga, 2011; Van Mele, 2011). Additionally, there is clear evidence that communication media in print, broadcast, electronic media, visual and social media formats have been used to disseminate agricultural information to rural communities (Fraser and Villet, 2000; Leeuwis, 2004; Van den Ban, 2005; Van Mele, 2011).

In Tanzania, the dissemination of agricultural information through communication media in print, broadcast and electronic formats in agricultural development is well

documented (Meerten and Rölling, 2000; World Bank, 2000; URT, 2008; ; Bucheyeki *et al*., 2011;Lwoga, 2011). For instance, in order to increase the agricultural technology uptake, universities, Research and Development (R & D) institutions, Non-Governmental Organisations (NGOs) and information providers have been disseminating agricultural information through communication media in print, broadcast and electronic formats to rural communities (Mbwaga, 2005; Chilimo *et al*., 2008; URT, 2008). However, previous efforts in agricultural information dissemination through different formats of communication media have not enhanced accessibility of such information in rural communities. This is because it has been reported that most of the rural communities do not have access to agricultural information (Mattee *et al*., 2008; Lwoga *et al*., 2011).

Although limited access to agricultural information is evident in rural communities, it appears that there has been a challenge on preference for communication media. In most cases, researchers and information providers assumed that rural community members are homogeneous. Hence, expected them to prefer the same communication medium in the same way for acquisition of agricultural information, but Leeuwis (2004), indicate that preference for communication media is influenced by the social environment. This environment is composed of heterogeneous groups of individuals that differ in their socio-economic status, interests in terms of content, access to communication media and information needs (Rölling, 1996a; Branston and Stafford, 2006; Savolainen, 2007, McNamara, 2008). This implies that underestimating preference for communication media by heteregenous individuals would appear to be among the major problems for acquisition of agricultural information in the rural communities.

In rural communities, due to variation in terms of locations, some communication media are accessed more in one location than in other locations and community members differ in terms of their socio-economic status, perceptions, acceptability of content of media and they are constrained differently to access and utilisation of different communication media. Hence, preferences for communication media in print, broadcast and electronic formats for acquisition of agricultural information among men, women and youths in the rural communities are likely to differ. Therefore, it is important to distinguish community members by establishing factors that influence their preferences for different formats of communication media.

In this view, it is important to realise that different factors influence individuals differently in their preferences for different formats of communication media (Watson-Manheim and Blangér, 2007). However, there is scant evidence from research on the established factors that influence preferences for communication media in print, broadcast and electronic formats for acquisition of agricultural information among men, women and youths in the rural communities particularly in Tanzania. Studies conducted in Tanzania did not establish factors that influence preferences for various formats of communication media in rural communties (Souter *et al.*, 2005; Matovelo *et al*., 2006; Sife *et al*., 2010). For instance, the study that was conducted in India, Mozambique and Tanzania by Souter *et al*. (2005) indicated that people tended to value and attach great importance to information sources and media they know and trust. The study, however, did not indicate what factors influence preferences and trust to communication media in the community.

Other studies that were conducted in rural communities in Mvomero and Kilosa Districts indicated that men have more access to information (Matovelo *et al*., 2006; Sife *et al*., 2010). However, they did not reveal preferences and factors influencing preferences for communication media in print, broadcast and electronic formats for acquisition of agricultural information by community members in rural areas in these districts. This study, therefore, has been undertaken to establish preferences for communication media in print, broadcast and electronic formats among men, women and youths for acquisition of agricultural information in Mvomero and Kilosa Districts.

1.2 Problem Statement and Justification

1.2.1 Problem statement

There is recognition from preference theory and literature that individuals' preferences for communication media within the organisations are influenced by their availability, accessibility and content (Rao *et al*., 1990; Webster and Trevino, 1995; Watson-Manheim and Blangér, 2007). However, it is not clear whether or not the same conditions influence heteregeneous groups the same way in their preferences for communication media in print, broadcast and electronic formats for acquisition of agricultural information in the rural communities in Tanzania.

In view of preference for communication media in rural communities, the study by URT (2003) assessed the preferences for communication media in acquisition of agricultural information among men and women in rural communities. However, it did not consider the youth despite having different needs and interests from men and

women. In addition, the study could not rigorously establish the influence of factors related to availability; accessibility and content of communication media in influencing preferences for communication media in various formats by men and women in the rural communities. This study, therefore, rigorously assessed the influence of factors related to availability, accessibility and media content on preferences for communication media in print, broadcast and electronic formats by men, women and youths in rural communities.

1.2.2 Justification of the study

There have been efforts by public and private sectors to disseminate agricultural information in rural areas through communication media in print, broadcast and electronic formats. However, most of rural communities in Tanzania do not have access to agricultural information (Mattee *et al*., 2008; Lwoga *et al*., 2011; Elly and Silayo, 2013). Studies such as Matovelo (2008); Mwakaje (2010) and Sife *et al*. (2010) pointed reasons that affected access to information as low literacy level; poor coverage of extension services; farmers' information needs not well addressed and lack of reliable electric power. More seriously, community members' preferences for communication media for acquisition of agricultural information in rural communities have not been rigorously studied. Furthermore, factors that influence community members in their preferences for communication media in rural communities have not been established.

This study provides the missing information on the factors that influence the availability, accessibility, acceptability of media content and constraints to utilisation

of communication media in affecting men, women and youths in preferences for communication media for acquisition of agricultural information. Results from this study will be useful in assisting information providers while disseminating agricultural information in rural areas through communication media in print, broadcast and electronic formats for agricultural sustainability. In addition, it highlights the contribution of the preference theory and knowledge in agricultural communication as far as available literature is concerned.

1.3 Objectives of the Study and Research Questions

1.3.1 General objective

The general objective of the study was to establish preferences for communication media for acquisition of agricultural information by rural community members in Mvomero and Kilosa Districts.

1.3.2 Specific objectives

(i) To assess the influence of availability of communication media on rural communities' preferences for communication media in print, broadcast and electronic formats.

(ii) To determine the influence of accessibility of communication media on preferences for communication media in print, broadcast and electronic formats by rural community members.

(iii) To examine the influence of media content on enhancing rural community members' preferences for communication media.

(iv) To examine the utilisability of communication media in print, broadcast and electronic formats in rural communities.

1.3.3 Research questions

This study was set to answer the following research questions (Refer to Appendix 14).

Specific objective 1: Availability of communication media in rural communities.

(i) What are the available communication media in print, broadcast and electronic formats for use in rural communities?

(ii) What are the factors that influence availability of communication media in print, broadcast and electronic formats in rural communities?

(iii) How does the availability of communication media influence preferences for communication media by men, women and youth in rural communities?

Specific objective 2: Accessibility of communication media in rural communities

(iv) What are the accessible communication media for use in rural communities?

(v) What are the factors that influence community members' access to communication media in print, broadcast and electronic formats in the rural community?

(vi) To what extent do socio-economic factors influence community members' preference for communication media in rural communities?

Specific objective 3: Examination of media content

(vii) To what extent are the available print media in the rural communities readable?

(viii) What are the factors that influence media content for the acceptability of communication media in the rural community?

(ix) How does content of communication media influence preferences for communication media by men, women and youth in rural communities?

Specific objective 4: Utilisability of communication media

(x) What are the major constraints that influence community members' access, utilisation and preferences for communication media in print, broadcast and electronic formats in rural communities?

(xi) How does perception influence utilisation and preferences for communication media in print, broadcast and electronic formats in rural communities?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This chapter presents reviews of theories and literature related to the study. In this study as suggested by Creswell (2007), the chapter starts with a theoretical review, in which relevant theories that focus on problem under the study were looked at and based upon deductively, followed by literature review. Lastly, this chapter identifies the knowledge gaps and provides a reflection on the methodology adopted in similar studies for improving the methodology and broadening the knowledge in this study.

2.2 The concept of preference

In this study, the concept of preference has been adopted. The concept of preference can be investigated in economics, management and communication perspectives in rational decision making. This study focused on communication perspective on community members' rational decision making on their preference for different communication media. It borrowed much from the concept of preference theorised by Rao et al. (1990) in their study on rational decision making in resource allocation which had an economic perspective and the study by Watson-Manheim and Blangér (2007) that has organisational communication perspective. This study applied this understanding on preferences for different communication media among community members in rural communities.

Communication media preference is defined as the way an individual makes rational decisions to choose right communication media to satisfy his/her desired needs or goal (Oskam and Hudson, 1999; Severin and Tankard, 2001; Watson-Manheim and

Blangér, 2007). In this study, communication media is defined as a tool for information sharing. Therefore, the rational decisions individuals make are based on options that maximize gains or satisfy needs (Rao *et al*., 1990; Chai, 2004). For example, in the context of this study, individuals make rational decision to prefer the information sharing tools that satisfy their gains or needs.

Preference for communication media as a concept can be traced from the preference science that emerges from studies and theories related to rational decision making. Therefore, communication media preference entails managing choices through change in the affective domain towards action of making choice. In this way decisions are made by individuals in choosing alternatives that satisfy their desire and needs. This process encompasses conscious changes in attitudes and feelings towards making right choices by availing individuals' different communication media. In this case, communication media preference in the context of this study is conceptualised on how men, women and youths in rural communities become attached to specific communication medium (media) to access and use agricultural information conveyed through that/those medium/media. According to Severin and Tankard (2001), communication media preference is preceded by awareness, knowledge and liking through conscious changes in attitudes and feelings towards actions.

The likes or dislikes take place in community members' environment. Therefore, the management and tracking of the process of choices of different communication media among community members in rural communities have been a challenge in most communication research. This is because community members are heterogeneous and

live in different social environments that involve different communication media and communication processes that might constrain or influence preference for communication media.

As far as rural areas are concerned, communication media preferences depend on who are the consumers of the media, the availability and accessibility of communication media and influenced by quality of information on the communication media, constraints and perception on access and utilisation of communication media in the rural communities for acquisition of agricultural information. In this study, preferences for communication media in print format (leaflets and booklets), broadcast format (television, radio) and electronic format (video, mobile phones, and internet) among men, women and youths were established. These media were chosen based on their popularity in disseminating agricultural information. Evidence shows that communication media in print, broadcast and electronic formats are used to disseminate agricultural information to rural communities (Bentley *et al*., 2003; Elly and Silayo, 2013).

2.3 Review of Preference, Mass Communication and Audience Analysis Theories

In order to understand how decisions are made on preference for communication media, the researcher reviewed preference theory, mass communication and audience analysis theories. The reviewed theories are framed within the rational selection perspective (Perry, 2002). The basic assumption of these theories is that people are purposive and intentional when it comes to choices and preferences. Three theories were reviewed: Preference Theory, mass communication and audience analysis

theories such as Habermas's Theory of Communicative Action (Habermas, 1984) and Media Uses and Gratification Theory (Katz *et al*., 1974).

2.3.1 Preference theory

This study was informed largely by the Preference Theory. The theory has potential applications to resources selection for preference in economics and other social sciences related fields (Rao *et al*., 1990). The theory provides guidance on how people make rational decisions to choose options based on gains or needs for their preference. The theory has been used as the theoretical basis in a number of studies on decision making in social sciences (Severin and Tankard, 2001). The theory is largely supported by proponents of rational choice like, Christoplos and Nitsch (1996) and Chai (2004) who claim that rational choice provides guidance for understanding human behavior and actions related to decision making. Therefore, the Preference Theory (Rao *et al*., 1990) provides a useful way to understand conditions and their related factors under which a communication medium is preferred.

The theory states that based on the environment they live in, all individual agents are simply assumed to be rational. That is, they have preferences that are total, reflexive and transitive. Therefore, the process of making decision on preference for communication media is a challenging task in view of possible different agents, locations, factors and conditions that influence choice. The theory is built under the following assumptions: (i) individual's choice for a product combination reveals his/her preference for that product; (ii) the consumer chooses and prefers only one combination at a given price-income line; (iii) individuals prefer a combination of

more goods to less in any situation; (iv) the consumer's choice is based on strong ordering; (iv) it assumes consistency of consumer behaviour. If A is preferred to B in one situation, B cannot be preferred to A in the other situation, (v) this theory is based on the assumption of transitivity. Transitivity, however, refers to three-term consistency if the consumer is to make a consistent choice from given alternative situations. If A is preferred to B, and B to C, then the consumer must prefer A to C.

Therefore, by total rational decision making, it is assumed that individuals have consistent behaviour on their preference and by transitive, means individuals' preferences are affected by available options that maximise their satisfication. It should be expected that the most accessible media would be preferred by individuals. By reflexive rational decision making, it means that individuals' decisions are influenced by the availability of the product, accessibility of the product in terms of socio-economic factors, constraints and content or attractivenss of the product. For instance, the increase of income increases individual's preferences for more than one option. In support of this assumption, media sociologists, Mitchell *et al*. (2006) asserted that reflexive decisions set contexts in influencing individual decisions based on different levels of structured relationship, interactions, knowledge, skills and symbolic systems. This is to say, socio-economic factors and constraints set the context for an individual to make a decision to prefer or not to prefer certain communication media. In addition, individuals may attach meanings to certain communication media based on quality of the content. This might influence them positively or negatively on their preference for such media.

In identifying the socio-economic factors influencing preferences for communication medium, knowledge gap studies, such as Donohue *et al*. (1975), cited by Severin and Tankard (2001) have largely concerned themselves with income and education level as major determinants of socio-economic status. However, studies by scholars such as Oskam and Hudson (1999); Adomi *et al*. (2003); Irmer and Bordia (2003); Fawole (2006); Nosheen *et al*. (2010) and Oladele (2010) identified factors like age, gender, education level, asset ownership, marital status, income and type of farming enterprise as socio-economic factors that influence a choice of communication medium. In addition, factors related to availability of product, accessibility of product and content of the product and their influence on individual's rational preference for communication media have also been reported to affect preference for communication media within organizations (Watson-Manheim and Blangér, 2007). Thus, this study applied this understanding on preferences for different communication media among community members in rural communities.

In this view, the Preference Theory provided a theoretical lens to better explain what socio-economic factors (age, gender, education level, asset ownership, marital status, income and type of farming enterprise) and what constraints or factors related to the availability of communication media, accessibility of communication media and media content influences community members on their rational preference for communication media for acquiring agricultural information.

2.3.2 Mass communication and audience analysis theories

In principle, mass communication theories operate more or less like "The Preference Theory" that provides guidance of what ought to be in individuals' preference for

communication media in the community. These theories include: The Media Use and Gratification Communication Theory (Katz *et al*., 1974) which states, preference for communication media is influenced by needs and interests of different people in a community. The theory suggests that communication media users take active roles in choosing what media to use to satisfy their needs. They use the media that have most influence on them. Hence, different communication media have different influences on people that use them with different degrees. The assumption is that any communication medium has to be goal specific. However, location and accessibility are major important factors in defining need for communication by a particular community (Carey, 1999; Fawole, 2006; Nosheen *et al*., 2010). Therefore, since different community members, such as men, women and youth have diverse interests and needs, there is a need to identify which type of communication media are accessible and preferred by different categories of community members (men, women and youths) for acquiring agricultural information in different locations basing on their interests and needs. In addition, media scholars, such as Black (1989) and Morley (1993) regarded The Media Use and Gratification Communication Theory as among the audience analysis theories. This is because it provides means to understand the relationship between the text and audience. The theory provides light on how text of the media is interpreted in which power to use the media content lies with the consumer not the producer of the message. In this way, consumers have much control over the consumption of the text. Therefore, community members are free to prefer a communication medium or not based on its content.

Again, this theory provides theoretical lens on how a certain communication medium is preferred on content basis. Other audience analysis theories that provide

understanding on the relationships between audience and texts include hypodermic theory and reception theory. The former is framed on the perspective that producers have much power and control over the media content, while later is largely concerned with agenda setting on public arena. They were not used in this study because of their limitation in influencing rational choices. They could not provide clear picture on how ownership and control of the media content influences preferences for such communication medium in the community.

Lastly, the Habermas's Theory of Communicative Action (Habermas, 1984) was used as the theoretical lens to understand how preference to communication media is influenced by the quality of information. This theory attempts to explain communication as a form of discourse, whereby language is seen as dialectic relationship with the social world. Discourse refers to written, spoken language and visual images that contribute to the construction of meanings (JΦrgensen and Phillips, 2002). A communicative action can be purposively rational in the sense that a language is used differently to attain specific goals or communicative action to achieve cooperation amongst individuals (Habermas, 1984). Therefore, critical discourse analysis was applied to examine how language use on communication media influences decisions and perceptions of readers to choose or accept print media. According to JΦrgensen and Phillips (2002) most of critical discourse analysis studies have concentrated on language use. They only examine the ways in which texts are produced or decoded, and hardly on how audience interprets texts. This study analysed quality of information of selected print media in the study area on language use in terms of simplicity and complexity, clarity of messages and

perceptions that might lead to confusion and compromising readers' ability to make right decisions, hence negatively influenced.

2.3.3 Deductions from preference, mass communication and audience analysis theories

In summary, it could be deduced that among the reviewed theories, the Preference Theory, the Habermas's Theory of Communicative Action and Media Uses and Gratification Theory were relevant to this study. The theories provide a clear picture that communication media preference in any community is influenced by (i) availability of communication media, (ii) accessibility of communication media in terms of socio-economic factors, (iii) constraints to communication media access and utilisation and perceptions, and (iv) media content that includes symbolic meanings associated with communication media (type of information, language use in message, and clarity of messages).

2.4 Stair-step Model of Communication Effects

In generating a better understanding of phenomenon and issues under the study, a Stair-step Model of Communication Effects (Lavidge and Steiner, 1961), cited by Severin and Tankard (2001) communication model was used in the construction of the conceptual framework (Fig. 2). This model describes and organises communication effects into stair-steps (Fig. 1). It also presents six steps, each of which must be accomplished before the one above can be attempted. These six steps are grouped into three dimensions: firstly, the cognitive dimension that deals with our knowledge of things. Secondly, the affective dimension that deals with our attitudes towards things and thirdly, the conative dimension that deals with our behaviour towards things (Lavidge and Steiner, 1961), cited by Severin and Tankard (2001).

This model is based on preference and decision making theories. Therefore, it was relevant to this study as far as communication media preferences are concerned. It is clearly indicated in the model that preference for communication media by an individual is preceded by awareness, knowledge and liking. This study was limited to three steps (awareness, knowledge and liking) of preference in the model as they seem to be relevant as far as rural community members' preference to communication media is concerned.

Therefore, in the context of this study, it was assumed that the availability of communication media in the rural community creates awareness to individuals that trigger the accessibility of knowledge on communication media. Based on availability, accessibility and content of the communication media, and their associated factors, community members are influenced to like or dislike the communication media in acquiring agricultural information. It was also necessary to find out what factors influence preferences for communication media among men, women and youths. The following factors related to availability (infrastructure, power requirements eg. electricity); accessibility (socio-economic factors-age; education; marital status; gender; type of farming enterprise; income; asset ownership; costs related to acquisition of communication media; location of the community); and media content (type of agricultural information; language use on media and clarity of messages on media) were analysed to establish their influences to liking or disliking of communication media as far as community members' preferences for communication media is concerned.

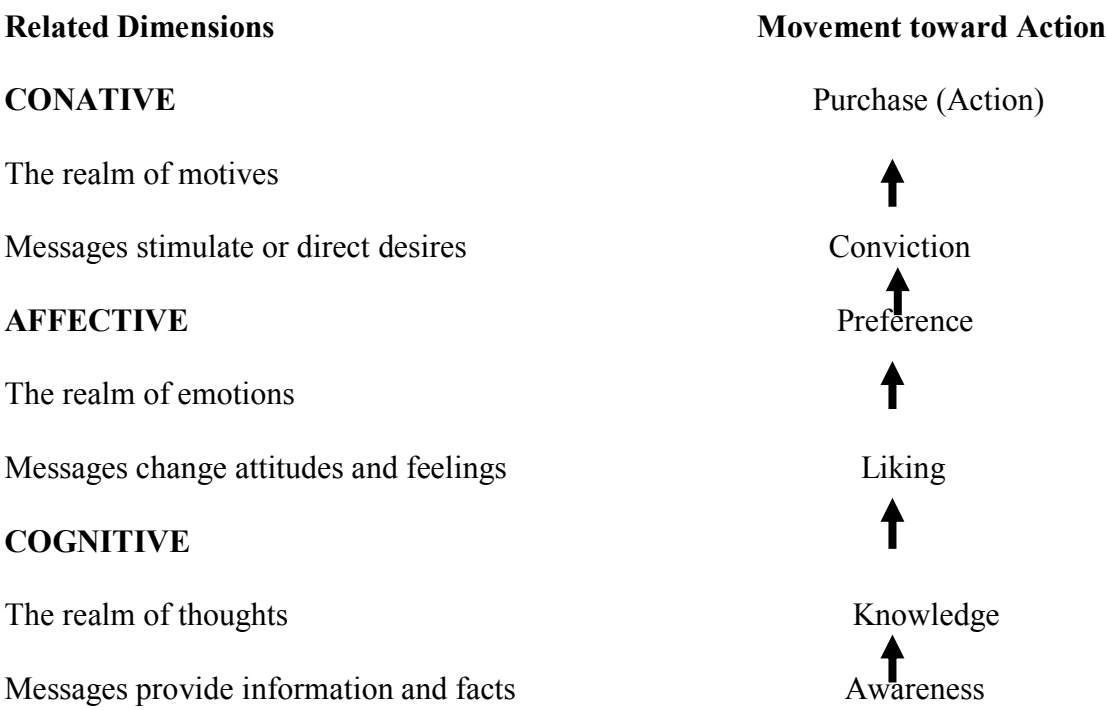


Figure 1: Stair-step model of communication effects

Source: R.Lavidge and G.A.Steiner (1961), cited by Severin and Tankard (2001:14).

2.5 Accessibility of Communication Media on Agricultural Information in Rural Communities

In many rural communities access to information often varies, largely due to differences in farmers' circumstances (Bertolini, 2004). Generally, communication media's access by community members has been found to be influenced by unequal access to communication media and agricultural information needs.

2.5.1 Unequal access to communication media

Women could make use of communication media to advance their agricultural production, but they are disadvantaged in terms of access to communication media. Researchers such as Adomi *et al*. (2003); Matovelo *et al*. (2006) and Mtenga (2007)

have indicated that men have more access to communication media than women. Therefore, unequal access to communication media between men and women does not only limit understanding on how information flows to them but also jeopardises their access to quality information.

2.5.2 Information needs

In Tanzania, for instance, marketing of agricultural produce is one of the overarching information needs for smallholder farmers in rural areas. Therefore, meeting farmers'/livestock keepers' market needs for their produce means encouraging agricultural productivity per unit area, as they will be motivated to invest more in production (Mwakaje, 2010; Oladele, 2010). In the study by Swanson and Rajalanti (2010), it was found that women have great need for agricultural information. However, women are trivialised in terms of access to quality information from various communication media (Fraser and Villet, 2000).

It was estimated that 60-70 percent of farm households, mostly women headed households in Tanzania do not have contact with quality public or private extension/advisory services (Mattee *et al*., 2008; URT, 2008). This is true as studies have indicated that public extension systems lack necessary information communication technologies and proper training programmes to keep their staff up to date and able to actually work out their more innovative extension programme activities in the field so as to reach different categories of people in the community (World Bank, 2000; Karshenas, 2001; Chapman and Tripp, 2003; Souter *et al*., 2005; Van Mele Van Mele *et al*., 2010). It is quite clear that based on agricultural information needs; the majority of rural communities do not have access to information from various communication media.

2.6 Availability of Agricultural Information on Communication Media

Studies such as Servae and Malikhao (2002), Hafkin (2003), Lwoga *et al*. (2011), Elly and Silayo (2013) indicated that the majority of community members attach importance to interpersonal means of communication as sources of agricultural information. These include traditional and interpersonal means such as parents, relatives, neighbours, village meetings, farmers' groups and input suppliers for their daily routines including acquiring agricultural information for their farm work, rather than communication media like Internet, radio, television, booklets, video, mobile phones and leaflets. However, it is well known that agricultural information has been transmitted through various communication media. Most studies have reported the role played by communication media in disseminating agricultural information as described below.

2.6.1 Availability of crop husbandry and post-harvest information on videos

The experience on video use among West African farmers in agriculture shows positive results. In his study on the role of video in scaling up sustainable rice technologies, Van Mele (2006) found that video is a valuable tool in sharing local rice knowledge and triggering new innovation in Benin, West Africa. The study found that tacit knowledge developed around in-house, such as seed storage techniques (more difficult to assess because of their private nature and hence remain in-house) was triggered, uncovered and shared with the wide community. In other studies that were conducted in Bolivia and Bangladesh by Bentley *et al*. (2003) on the provision of agricultural information related to pests and diseases through "going to public method" indicated that, extension agents meet farmers, foreigners and other stakeholders in public places in rural areas such as open markets and share new

innovation and problems related to agriculture and analysis of problems together with them through communication media in print format (booklets, leaflets, etc.) and electronic format such as video. This method proved to be successful in facilitating information sharing with rural communities.

Furthermore, in Tanzania, Mbwaga (2005) reported that video has been used in disseminating agricultural production practices, for example, promotion of green manure for enhancing upland rice productivity on striga infested fields in rural community. The engagement of video users in information acquisition adds value in the communitaion process. However, the challenge is how to reach all community segments in the community through video as a means of communication. White (2003), Howey (2005) and Akrofi (2006) asserted that communities differ in terms of interests, concerns, hopes, needs and experiences. Therefore, it is not clear whether or not community members such as men, women and youths preferred video as their source of agricultural information in rural communities.

2.6.2 Availability of crop/livestock husbandry practices and marketing information on the web

Studies like Pigato (2001), Dragon (2003) and Van Mele (2011) have indicated that the web has been useful in providing access to new technologies and market information worldwide. Likewise, in Tanzania web has been used to disseminate crop and livestock husbandry knowledge to the rural people (URT, 2005). The initiatives of disseminating information include: disseminating market information through the Agricultural Business Information Services (BIS) in Tanzania to enable rural farmers to access information on crop prices via the web (URT, 2005) and the establishment of tele-centres and information sharing WebPages (Lwoga, 2010). Examples include:

Karagwe District (FADECO tele-centre), Kasulu District (Kasulu Teachers' College tele-centre); Kilosa Rural Services and Electronic Communication-KIRSEC; Kilosa tele-centre, Moshi Rural District (Marangu Village Internet Services), Mpwapwa District (Teachers' College Multi-purpose Tele-centre) and Songea Rural District (Wino Development Association).

Despite the increasing importance of the internet in providing access to new technologies and market information worldwide, the study conducted by Lwoga (2010) found that out of these tele-centers, it is only two tele-centers that use internet to deliver agricultural knowledge and information to farmers in response to their queries and needs.

2.6.3 Availability of agricultural information on radio

Besides the growing use of video and the internet in disseminating agricultural information, studies have shown that radio is still the major communication medium used by rural communities in Africa, Asia and Latin America to access agricultural information (Bagnall-Oakeley *et al*., 2004; Rodriguez *et al*, 2015). Agricultural information on the radio has been made accessible to community members in rural communities through their listening groups. For instance, according to Kalusopa (2005), PANOS South Africa reports that women in Zambia organised into radio listening clubs were able to learn new ideas from neighbouring communities on issues ranging from maize production to marital strife. These clubs have been instrumental in revealing hidden issues such as tacit knowledge, marital strife, etc. (Pigato, 2001; Kalusopa, 2005; Van Mele, 2006). However, in the Sub-Saharan Africa and West Africa social groups like radio listening clubs have not only been

instruments of change, but also influencing men and women preference for radio and video (Akrofi, 2006).

In Tanzania medium wave radio and various FM radio stations have been used in disseminating information. These include the Orkonerei Community Radio in northern Tanzania (Simanjiro District), FADECO Community Radio (Karagwe District), Iramba Community Radio (Iramba District), Kitulo Community Radio (Makete Distict) and Nuru Community Radio (Iringa Municipality). Others are Micheweni Community Radio (Pemba, Zanzibar), Radio Mlimani (University of Dar es Salaam, Dar es Salaam), Radio Sauti (St. Augustine University, Mwanza), Radio Kwizera (Ngara District), Kilosa Community Radio (Kilosa District), Sengerema FM Radio (Sengerema District) and Farmers' Voice Radio through Radio Maria, the list is not exhaustive (Mpehongwa, 2009; URT, 2005). However, less is known about how much and what kind of agricultural information is being accessed by smallholder farmers through radio in Tanzania. This is because much of the existing research suggests that a lot of information that is being broadcast through radio does not relate to agriculture (Moemeka, 2000; Carpentier *et al*., 2002; Kadago, 2009; Chilimo *et al*., 2011; Sife *et al*., 2010). The study conducted by Sife *et al*. (2010) in Tanzania to assess whether communication media in broadcast format (television and radio) had replaced or complemented extension services found that radio and television did not provide adequate agricultural information to rural community members. In addition, other studies like Sanga *et al*. (2013) revealed that most of disseminated agricultural information through radio stations did not reach the target group.

2.6.4 Availability of marketing information on mobile phones

Mobile phones are also regarded as useful communication media. For instance, The Commission of Africa Report (CAR) (2010) points out that Sub-Saharan Africa has continued to expand as a major market for mobile phone technology. Between 2003 and 2008, it was the World's fastest growing mobile phone market. Studies worldwide such as Mishra (2003); Molony (2006); Gakuru *et al*. (2007); Myhr and Nordstrom (2007) and Robertson (2012) have indicated that mobile technology has enabled people to access various information including market information.

In Tanzania, studies conducted by Commission of Science and Technology (COSTECH) and Economic and Social Research Foundation (ESRF) (URT, 2005) and Mwakaje (2010) indicated that Short Message Services (SMs) have been used to increase access to market information and improved choices for the sale of farmers' produce and strengthened farmers own capacities when negotiating in the input and output markets in Tanzania. Nevertheless, there is no concrete data to justify this claim. In another study by Samwel *et al*. (2005), Tanzanian fishermen revealed that the use of a mobile phone increased fishermen's bargaining power and improved access to knowledge about market opportunities and a possibility to work more efficiently.

On the contrary, in his study on the use of mobile phones for marketing perishable produce in Tanzania, Molony (2009) found that cell phones were considered relatively unimportant because personal relationships were formed during the meetings conducted in person. In addition, the study revealed that those farmers on the "mobile phone margins" are often caught in a credit dilemma whereby they have

little choice but to accept the price they are given by their creditor. Furthermore, studies conducted by Bertolini (2004) on the use of mobile phones showed that their wide use has enabled rural people in Tanzania and India to get access to agricultural information related to markets. It has been reported by Samwel *et al*. (2005) that the growing use of phones in Tanzania is mainly contributed by increasing popularity of mobile phones, regulatory reforms, falling costs and prices, and technological innovation. However, while mobile phones seem to be extensively used to enhance access to market information, less is reported on their use in disseminating agricultural production information.

2.6.5 Availability of agricultural information on print communication media

In Tanzania, Research and Development (R&D) institutions have been very instrumental in enhancing dissemination of agricultural information through different print media (eg.newspapers, brochures, leaflets, posters, etc.) (Mbwaga, 2005; Chilimo, 2008; Matovelo, 2008). In her study, Matovelo (2008) found that despite having limited access to printed materials, farmers valued them as a source of information, but did not meet their information needs. Other studies have indicated that there have been distinct variations with regards to community members' knowledge needs in different locations and socio-economic status (Bagnall-Oakeley *et al*., 2004).

2.7 Role of Socio-economic and Institutional Factors in Influencing Communication Media Preference and use in the Community

The study conducted by Webster and Trevino (1995) suggested a need for further research on the influence of multiple factors in communication media choices.

However, studies conducted by Lwoga *et al*. (2011), Elly and Silayo (2013) found that despite the existence of communication media in broadcast format (radio, television), electronic format (video, mobile phones and Internet) and print format (leaflets, booklets) in rural areas, they were used at low rate. The studies could not show who utilised these media at low rate in the community and what were the push or pull factors for community members' to prefer a communication medium or certain communication media at the expense of others. This sub-section reviews the influence of institutional and socio-economic factors on preference for communication in the rural communities.

2.7.1 Institutional factors

Institutional factors have an influence in social learning through communication media (Rölling, 1996b; King and Xia (1997); Mitchell *et al*., 2006; Lee, 2007; Araka, 2008; Van Mele *et al*., 2010). However, Rölling (1996b) contends that social learning may be inhibited by social pressure, problems with representation, unequal power balances and constrained innovation space. Evidence in Australia showed that the use of communication media for acquiring information on innovation for large scale dairy farmers in socially complex environment was influenced by interconnectedness of their formal institutions (O'Kaine *et al*., 2008).

2.7.2 Socio-economic factors

Research studies by Leeuwis (2004); Mugwagwa (2009); Nosheen *et al*.(2010); Van Mele *et al*.(2010); Juanwen and Niehof (2011) have found that sharing of agricultural knowledge and innovations in the local communities is inhibited by

factors such as age, gender, marital status, income, political influence, attitudes, culture, perceptions, and social relationship. For instance, in their study on the use of Visual Problem Appraisal (VPA) as a tool for facilitating dialogue in the Kerala Coast in India, Witteveen and Enserink (2007) found that cultural issues (such as social status in the community) dictate the accessibility of communication media to different categories of people in the community.

However, the influence of socio-economic characteristics such as education, marital status and age, type of crop/enterprise, income, farming experience, and asset ownership on influencing preference for communication media in print, broadcast and electronic formats in acquisition of agricultural information by high and low-income men, women and youth of the rural community is not well documented. The influence of socio-economic characteristics on choice and preference for communication media has attracted a great deal of interest in recent years. In particular, Oskam and Hudson (1999); Severin and Tankard (2001); Servae and Malikhao (2002); Adomi *et al*. (2003); Van De Ban (2005); Fawole (2006, 2008); McNamara (2008); Ajayi and Solomon (2010); Mwakaje (2010) and Nosheen *et al.*(2010) said that there is an existing relationship between the influence of existing socio-economic factors and community members' preference for communication media, where the socio-economic factors like age, marital status, education level, asset ownership, income and type of farming enterprise may either push or pull the community member towards choice or preference for communication media.

The study conducted by Oskam and Hudson (1999) identified age to be the most important community member's socio-economic characteristics that significantly influenced choice and preference for communication media. Additionally, the study conducted by Ajayi and Solomon (2010) found that the older the farmer is; the more they would be willing to take risks associated with new farming methods, hence more motivated to choose any communication media for agricultural information acquisition. Furthermore, King and Xia (1997; Rashid and Elder (2009) found a positive relationship between age and media choice and preference. This means, age is a factor that pushes individuals to choose and prefer certain communication medium (media). Therefore, age in this study was expected to have positive sign in the regression equation.

The study by Mtenga (2007) found that marital status had positive influence in terms of production and marketing descisions among African communities, For instance, marriage influences men and participation in agricultural groups to advance their agricultural production to meet families' food and income. This automatically influences their preference for different communication media. Marital status was expected to influence community members positively in their preference for communication media. Therefore, marital status in this study was expected to have positive sign in the regression equation. Other studies by Adomi *et al*. (2003); Nosheen *et al*. (2010) indicated that gender has largely been found to positively influence the choice of communication media. In this view, gender in this study was expected to have positive sign in the regression equation.

Again, the study conducted in Nigeria by Fawole (2006), established a positive significant relationship between educational level and communication media choice. This means, education level is the factor that pushes individuals to choose and prefer certain communication medium (media). Therefore, in this study education level was expected have positive influence to community members in their choice for different communication media. Therefore, education level in this study was expected to have positive sign in the regression equation. In addition, the study conducted by Adomi *et al*. (2003) and McNamara (2008) found that the ownership of assets influenced positively the use of broadcast and electronic communication media. Therefore, in this study ownership of assets was expected to have positive effect to community members in their choice for different communication media. Therefore, asset ownership in this study was expected to have positive sign in the regression equation. Furthermore, knowledge gap studies, like Donohue *et al*. (1975), cited by Severin and Tankard (2001) had largely found that people with high income always choose print media (newspapers, booklets, etc.). Likewise, studies like Oskam and Hudson (1999); Fawole (2008), Mwakaje (2010) and Nosheen *et al.*(2010) found that income had a positive influence in terms of pushing an individuals' choice for communication print media. Therefore, it was expected in this study that as income of community member increases would have a positive influence on his/her preference for more than one communication medium. Hence, it was expected that asset ownership would have positive sign in the regression equation.

Finally, studies have shown that type of farming enterprise might influence a community member either positively or negatively in his/her choice for

communication media (Van De Ban, 2005; Fawole, 2006). This means type of farming enterprise either pulls or pushes an individual in preferring certain communication media. For instance, the study conducted by Van de Ban (2005) found that farm families in Asia (China and India) that involved in high value horticultural crops earned high income and were positively derived to search for information from various communication media. Therefore, in this study, type of farming enterprise was expected to influence a community member either positively or negatively in his/her preference for communication medium (media). Therefore, type of farming enterprise in this study was expected to have positive or negative sign in the regression equation.

2.8 Constraints to Communication Media Usage by Community Members

Communication media can improve service delivery to the poor; provide better and equal access to information; and connect the remote rural areas to the rest of the world (Thomas, 2002; Ramírez and Quarry, 2004; Jensen, 2009). Although communication media enable remote and poor farmers to get access to agricultural information, farmers live in different social environments that have influence on the uptake of information from communication media within the innovation system (Swanson and Rajalanti, 2010). The question is on capturing the interdependence of people in decision making. That is, the decision to prefer a certain communication medium at the expense of others. For instance, media scholars such as Mwakaje (2010) and Nosheen *et al*, (2010) are of the view that the reliability of information provided by various communication media plays important role in building repute among their clients as well as sustainability of long-term intergrity of the media.

Apart from the reliability of information in the communication media, studies have also indicated major factors that limit rural community members' access to media in developing countries including Tanzania, especially in rural areas. These include underdeveloped infrastructure (UNESCO, 1996; Bertolini, 2004); lack of electricity, technical knowhow (knowledge and skills) (Irmer and Bordia, 2003; Caspi and Gorsky, 2005; Adebayo and Adesope, 2007), and poor regulatory apparatus (UNESCO, 1996; Matambalya and Wolf, 2006; Lightfoot *et al*. 2008; McNamara, 2008; Sommers, 2010; Dabaj, 2011); language barriers (Lwoga, 2010; Chigona and Mooketsi, 2011); social and cultural issues (Mishra, 2003; Witteveen and Enserink, 2007) and economic constraints (high costs and low level of income) (Chowdhury and Wolf, 2003; Bertolini, 2004; Iwe, 2005; Hudson, 2006; Ogbona and Agwu, 2013). Proponents of knowledge gap studies like Severin and Tankard (2001) said that the major factor that inhibits preference for communication media were the expendicture spent to search for information from the communication media. However, those studies could not indicate what kinds of people in the community were severely affected by income when it comes to communication media preference. It is only the study by Robinson and Robertson (2010) that indicated only young men have been found to positively engage in new communication technology such as communication media in electronic format like the internet. According to Sebigya and Kuzilwa (2010) youths have been found to be risk takers in agricultural production, hence their access to information from communication media should not be underestimated. Again, Robinson and Robertson (2010) found that income (to buy gadgets and payments for bundles) especially for electronic media was a bottleneck to engage youths in information sharing. Additionally, Adomi *et al*. (2003); Heyzer

(2005); Iwe (2005); McNamara (2008) and Robertson (2012) indicated that access to communication media is not always an issue, but also time taken in getting the media and content (message) is of a paramount importance.

In the context of constraints to usage of communication media, much of the existing research suggests that rural community members are limited by a number of constraints in accessing communication media. By contrast, Elly and Silayo (2013) are of the view that modern sources of information (communication media) would have become more convenient and perhaps more suitable sources of information if they were more context-specific. However, one area of controversy in the literature about context-specific information revolves around the question of how to make context-specific communication media without considering major constraints to media access? Research on communication media has shown that constraints influence rural community members' decision for preference to communication media (Defleur, 1998; Moores, 2000; Meyer and Boon, 2003; Mitchell *et al*., 2006), but could not tell on major constraints to communication media preference. There is a need to explore major constraints that influence community members to prefer certain communication media not the other for proper and integrated actions.

2.9 Clarity and Relevance of Message in Influencing Community Members' Preference for Communication Media

Various communication media have been used in disseminating agricultural information in Tanzania (URT, 2003; Mbwaga; 2005; Matovelo, 2008). However, it has been found that the production of communication media in print, broadcast and electronic formats and their use in disseminating agricultural information has been

given more attention than content, technical quality and how men, women and youths attach preference to different communication media within the community (Moemeka, 2000; FAO, 2002).

Therefore, clarity and relevance of the messages from communication media are of great concern in the globalised world. This is because the clarity of message from communication media has a driving effect to their preference by community members for information acquisition (Pearson *et al*., 2003). However, little attention has been paid on how understandable are the media (in terms of language use in message, interpretation, and clarity of message in the media) and used by different rural community members. Studies by Mccombs (2004); Chigona and Mooketsi (2011); Krippendorff (2013) and Foot (2014) indicate that language use in print media may influence the reader's understanding of the text. It is therefore, of academic interest to understand how print media discourse affects preference for communication media.

In support of the idea, a number of studies have analysed the media discourse in various fields such as education (Chigona and Mooketsi, 2011), politics (Garramone and Atkin, 1986; Foot, 2014) and health (Karpf, 1988). Therefore, much of the existing studies suggest that discourse analysis has been carried out in education, politics and health sectors and no study has been reported to have been carried out on discourse analysis of print media that carries agricultural information.

2.10 Perception on Message Presentation

Communication takes place under the influence of social relationships, perceptions and interests (Rölling, 1996b; Johansson *et al*., 1999; Severin and Tankard, 2001 and

Dragon, 2003). For example, quoting Scott's work of 1994 on perception of pictures, Severin and Tankard (2001) articulated that the use of pictures in the communication media might be a transparent representation of reality as they are capable of representing concepts, abstractions, actions and metaphors. In that line of thinking, the study by Johansson *et al*. (1999) on preference test that was performed on correct or false information about the tomato growing system, the results showed that preference was influenced not only by tomato perception, but also by the way the product information was presented. This result agrees with Schär and Kruger (2014); who asserts that information presentation style can either influence individuals' positively or negatively on their perception towards the media in question. However, there is no documented study on how the use of pictures or agricultural messages presentation style influenced preference for certain communication by rural community members in Tanzania.

2.11 Preferences for Communication Media in Rural Areas: Review of Empirical Studies

Various studies have been conducted to investigate and explore preferences for communication media in rural areas in developed and developing countries, and others in rural areas in Tanzania (Oskam and Husdon, 1999; Adomi *et al*., 2003; Fawole, 2006; Nosheen *et al*., 2010; Lwoga *et al*., 2011; Elly and Silayo, 2013).

Oskam and Hudson (1999)'s study on "Media preference and believability among rural respondents for news and advertising information" was conducted in rural areas of the South Plains and lower Panhandle of West Texas in the USA to find out the preference for radio, television, newspapers, magazine and other communication

media among Hispanics, Anglo and Afro-American races. They found that among the variables studied, education and income were significantly found to influence communication media preference. Respondents with high income preferred newspapers. With regard to educational level, respondents with higher education depended on newspapers and magazine and the significant difference was found on communication media preference based on their race. Hispanics preferred television to other media than Anglo and Afro-Americans. However, the study was silent on preference for communication media by other gender groups in the rural communities. Additionally, the study did not show the model used to analyse data as the dependent variable has more than two categories (polytomous), that is preference for communication media by more than one race (Hispanics, Anglo and Afro-Americans). According to Greene (2003) there is a need of using a model in explaining the relationship between dependent (with more than two categories) and independent variables.

Another study by Adomi *et al*. (2003), investigated "the gender factor in crop farmers' access to agricultural information in rural areas of the Delta State in Nigeria". They found that farmers rely heavily on personal experiences followed by neighbours as sources of information. When it comes to preferred sources of information: female farmers preferred written sources of information (newspapers and magazines), while male farmers preferred oral sources of information (neighbours and relatives). However, the study did not consider other written sources of information such as booklets, leaflets, etc. In addition, female farmers reported a greater need for agricultural information (on availability of credit and improved methods of farming) than male farmers. The major factor that hinders access to

agricultural information was lack of visits by agricultural extension officers. The study did not address the youth in terms of what communication media they prefer in acquisition of agricultural information.

Another survey study that was conducted by Fawole (2006) on "poultry farmers' utilisation of information in Lagelu local government area, Oyo State of Nigeria", indicated that poultry farmers' information sources were television (68%) followed by veterinary personnel (52%). They also preferred television as their source of animal health information. Severe constraints to communication media access included the cost of obtaining information, absence of extension workers and scanty contact with private veterinary personnel while less severe constraints included inappropriate time of airing agricultural programmes, erratic electricity supply and scarcity of day-old chicks. The findings also showed that poultry farmers' sex and education level were found to significantly influence communication media preference.

A study by Nosheen *et al*. (2010) in five villages in Pohar Region in Pakstan found that females preferred television, while males preferred relatives as sources of farm practices. This study could not determine the variables responsible for influencing males' or females' trust for certain sources of information. Furthermore, a study by Lwoga *et al*. (2011) on "access to and use of agricultural knowledge and information in the rural areas of Tanzania" revealed that the majority (89.1%) of farmers in rural areas in Tanzania preferred radio for accessing information and knowledge on farming system due to its oral nature, low cost and its independence of electricity. However, despite being the most preferred communication medium, it was used at

low rate. The study findings demonstrated that knowledge and information needs and information seeking patterns of farmers were location specific.

Finally, an investigation of rural farmers' information needs and sources were conducted in Iringa Rural Distict, Tanzania by Elly and Silayo (2013). This study was conducted based on the argument that information needs are context specific in terms of space and time and it is not always a plausible assumption to generalise these needs. Elly and Silayo (2013) showed that, to a great extent, farmers used traditional and interpersonal means of communication in accessing agricultural information whereas they used modern communication media (such as radio, television, video, mobile phones, Internet, leaflets, booklets, etc.) to access non-agricultural information. The study recommended that information producers should identify proper mechanisms of disseminating information among rural farmers through active link between producers and sources that relay information to them. However, the phrase "among farmers" implies different categories of farmers who have different preferences. It is interesting that the researchers could not tell which communication media rural farmers' accessed to acquire that specific type of information. It is said by Rölling (1996a) that farmers in rural communities are heterogeneous and make various choices to satisfy their needs. Therefore, there was a need to find out which information was received from what type of communication media and by whom in the rural community.

2.12 Knowledge Gaps from Theories, Literature and Empirical Studies

On the basis of preference theories, communication theories and communication models, the literature review has shown that different community members have different preferences for different communication media. It has been indicated that there is variation in information needs amongst rural communities which implies a need to consider what type of information to send through what type of communication media that is preferred by a specific group of people in the community. However, most of the reviewed studies have been exploratory or rather descriptive in explaining why research information through various formats of communication media does not find its way to rural communities.

It is important to realise that theories and literature review show that there was neither quantification of crucial socio-economic factors and constraints nor scientific proof on the established factors related to availability and accessibility of communication media and their content on influencing the preference for communication media by men, women and youths in the acquisition of agricultural information in rural communities (gap 1). In addition, youths have been a forgotten group in studies on preferences for communication media in acquisition of agricultural information (gap 2). This study extended other studies while including youth as a specific group under the investigation.

Empirical studies in section 2.11, for example, the study by Lwoga *et al*. (2011) was limited to information needs and major sources of agricultural information, while in the present study, together with sources of agricultural information (which in the context of this study refers to communication media), issues that influence

preferences for agricultural information sources such as socio-economic factors, major constraints, and content of communication media (print format) were rigorously studied to determine their influence to rural community members' preference for communication media. In addition, the study by Oskam and Hudson (1999); Fawole (2006); Lwoga *et al*. (2011); Elly and Silayo (2013) could not empirically explain the influence of individual characteristics when different community members are confronted with multiple communication media choices for preference. Therefore, in this study, a Multinomial Regression Model (MRM) was used to establish the influence of individual (socio-economic) characteristics in influencing preferences for different communication media among men, women and youths in the study area.

2.13 Conceptual Framework

The developed conceptual framework depicts the variables of the study and their relationships (Fig.1). It was built from the Preference Theory (Rao *et al*., 1990) and a Stair-step Model of Communication Effects (Lavidge and Steiner, 1961), cited by Severin and Tankard (2001). In addition, mass communication and audience analysis therioes such as Habermas's Theory of Communicative Action (Habermas, 1984) and Media Uses and Gratification Theory (Katz *et al*., 1974) were used as support theories to understand what influences community members' decisions to prefer communication media as they are framed within the rational selection perspective. The Preference Theory is relevant to this study because people are assumed to be purposive and intentional when it comes to choices and preferences. According to this theory individuals' rational preferences (likes or dislikes) are affected by available options that maximizes their satisfication; individuals' decisions is influenced by the

availability of the product, accessibility to the product in terms of socio-economic factors, constraints and content or attractiveness of the product.

The conceptual framework (Fig.2) considers factors related to the availability, accessibility and content on how they influence community members in rural communities in making rational decisions to preference for communication media for acquiring agricultural information as independent variables. Therefore, the concept of preference for communication media by community members as a dependent variable in this study is measured in terms of factors related to the availability, degree and extent of influence of the socio-economic factors on accessibility of communication media, while content of the media in terms of quality of information is considered to influence community members in their acceptability of communication media.

In this study, constraints and perception are considered to be intervening variables that may indirectly influence accessibility and acceptability of the content of the media on community members' preference and utilisability of communication media. The conceptual framework guided the study to establish which communication media in print, broadcast or electronic formats were preferred by men, women and youths based on their availability, accessibility and media content. Terms used are defined clarified below.

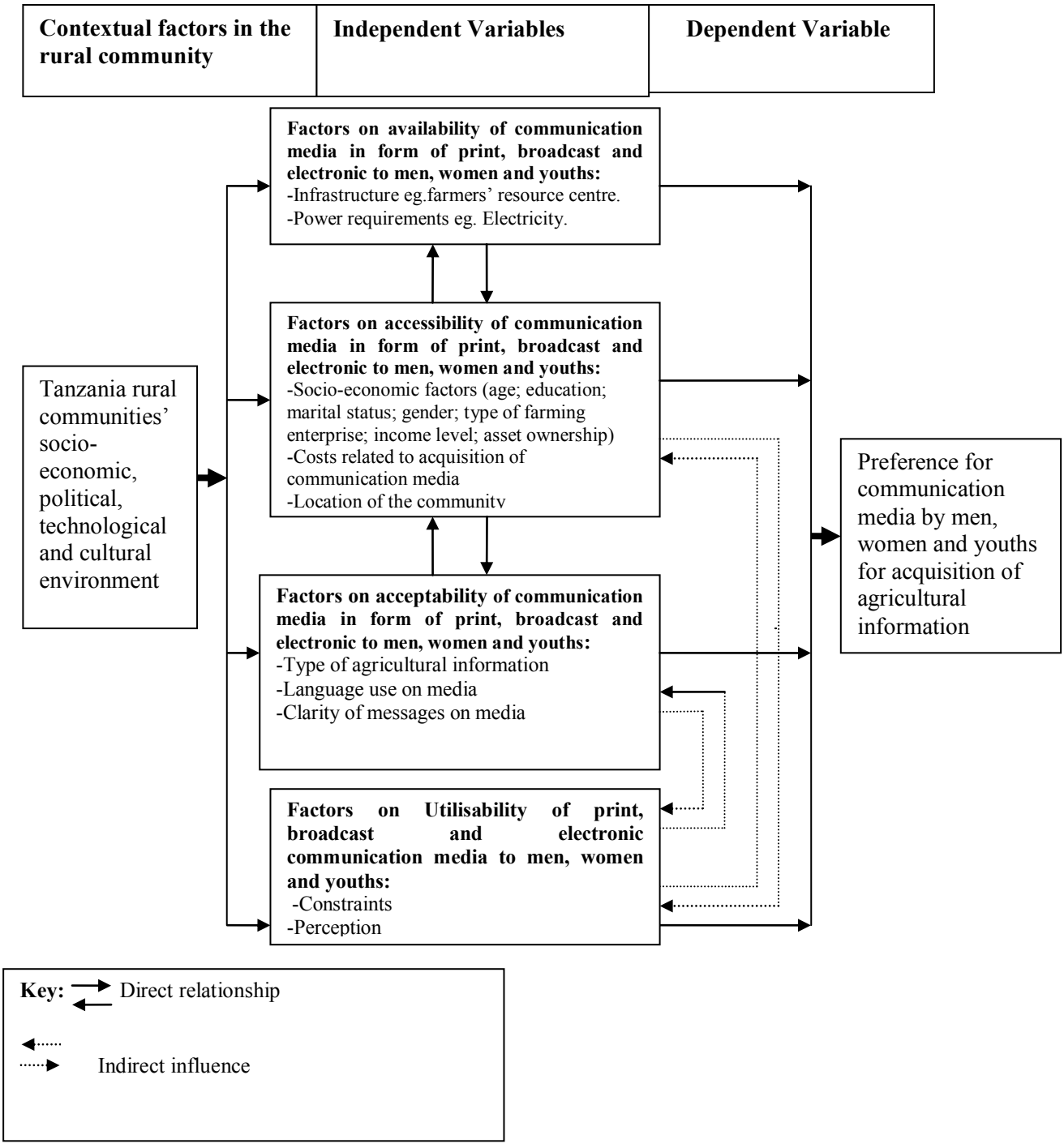


Figure 2: Conceptual framework for the study

2.14 Definitions of key terms

1) Acquisition

For the purpose of this study acquisition is defined as extent to which a rural community member gets agricultural information based on availability, accessibility and content of communication media in print, broadcast and electronic formats.

2) Rural areas

The International Telecommunications Union (ITU) (2000) defines a rural area as a place that is characterised by deficiency or absence of public services (e.g. reliable electricity supply, etc.), a low level of economic activity, low per capita income and underdeveloped social infrastructures (e.g. education facilities, etc.). Two characteristics are common in the selected study sites; especially most villages in these districts. The villages are characterised by isolation and poor infrastructures.

3) Consumers of communication media

This study defines consumers of communication media as men, women, and youths in the rural community. In other studies such as those of Mtenga (1997), Oskam and Hudson (1999) and Match *et al*. (2005) they are referred to as gender groups.

4) Gender

In the context of this study, gender is defined as socially constructed relationship among men, women and youths in their access to communication media and constraints they face relative to each other on access to communication media for acquiring agricultural information. Community members like men, women and youths have different interests and needs.

5) Youths

This study defined youths as individuals who have attained 18 years to 35 years. This study aimed at bridging the gap left by other studies as youths were not considered in preference for communication media, hence they were treated as homogenous group since their interests and needs in literature did not seem to differ. Literature suggests that regardless of being male or female they are all aggressive. For instance, Sebigya and Kuzilwa (2010) contend that youths are risk takers, hence aggressive when it becomes to agricultural production. This is to say, youths tend to attach importance to communication media that have influence on them in terms of access to information in agricultural production.

6) Communication media:

This study defines communication media as a tool for sharing agricultural information available in print, broadcast and electronic formats:

a) Print media

This study defines print media as leaflets and booklets that disseminate agricultural information in the form of ink on paper. Studies such as Mbwaga (2005); Chilimo *et al*. (2008); URT (2008) indicated that leaflets and booklets unlike newspapers have been widely used to disseminate agricultural information in Tanzania. According to the study by Rodriquez *et al* (2015), newspapers are least used in Africa to access agricultural information.

b) Broadcast media

This study defines broadcast media as radio and television that scatter the produced agricultural information in form of program while transmiting it.

c) Electronic media

This study defines electronic media as mobile phones, video and internet that depends on the support of several components or more than one device while displaying sounds or images related to agricultural information.

7) Community

Community is defined as a group of individuals with common or some common interests and stronger communication within and across the boundaries (Markus, 1987).

8) Availability of communication media

This study defined availability as the physical audit and observations of communication media. In this study, availability of communication media was measured by three point Likert Rating Scale of whether they were easily available, available with difficulties or not available.

(a) **"Easily Available"** means physical availability without difficulties of most communication media in form of print, broadcast or electronic media to beneficiaries of various agricultural projects, in public places and availability of communication communication infrastructures (eg. Satellites dishes, mobile phone towers, information centers, etc.),

(b) **"Available with difficulties"** means physical audit or observation of few communication media and poor wave receiptivity of some mobile phone networks, television and radio stations, while

(c) **"Not available"** means absence of communication infrastructure and of communication media in print, broadcast or electronic formats to agricultural projects beneficiaries and public places.

9) Access to communication media

The study defines access to communication media as the extent to which a rural community member can obtain communication medium at the time it is needed to access information. Accessibility of communication media by community members was assessed based on costs related to acquisition of communication media, location of the community and analysis of socio-economic factors. The measurements on the influence of socio-economic factors in influencing community preference for communication media in this study were achieved through multinomial regression analysis.

10) Constraints

The study defines constraints as those things that limit access and utilisation of communication media by the community members within and across the community's boundaries. These constraints vary from one community to the other. The constraint was classified whether it was a major constraint by Eigen factor. When the constraint was greater than 1.0 it was said to be an influential constraint.

11) Information need

In the context of this study, information need is defined as a community member's overarching need for established knowledge to satisfy his/her goal in agricultural

production. Information need was measured in terms of what information is needed most by men, women and youths in the rural community.

12) Media content

In the context of this study, media content is defined in terms of actual subject in form of quality of agricultural information on the communication media. The quality of agricultural information on the media considered the type of agricultural information, language use on the media; and clarity of message on the media.

(a) Agricultural information

Agricultural information in this study is defined as a broad range of established knowledge on farming and livestock husbandry practices, post-harvesting, markets, funding, weather, climate, etc available on communication media in print, broadcast and electronic formats for community members' use in their agricultural production.

(b) Language use on the communication media

Language use on the media in this study is defined as pattern ways of transmitting ideas (in terms of its simplicity or complexity) on the communication media and whether it has indirect influence on acceptability of print media by men, women and youths.

(c) Clarity of message on communication media

Clarity of message is defined in terms of whether information on print media is free from errors or is easily readable and understandable by community members. It was measured in terms of average sentence length and length of the words in sentences to

determine whether it was readable to the community members who have certain levels of education.

13) Perception

Perception in the context of media studies refers to how people construct a reality around their environments based on their mental faculty or sensory organs depending on the way information is packaged on the media (Rogers, 1993; Branston and Stafford, 2006; Foth and Hern, 2007). Perception was measured by a five point likert scale on whether community members strongly agreed, agreed, did not know, disagreed or strongly disagreed that the perceived message presentation style influenced their preference and utilisation for communication media.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Overview

This chapter describes methods and procedures used in the study. It describes the choice of the study areas, research design and sampling procedure. This is followed by the presention of data collection and analysis methods. Finally, it discusses the data quality control procedures, where validity and reliability measures are highlighted.

3.2 Study Area

The study was carried out in Kilosa and Mvomero Districts (Fig. 3 and Fig. 4). These Districts were selected from other districts in Morogoro region to delimit the study areas. They were selected for their uniqueness in terms of potentiality in agriculture and their close proximity to Sokoine University of Agriculture (SUA), research institutes and centres (e.g. ARI-Ilonga in Kilosa District and Agro-scientific Research Centre in Mvomero District), availability of a wide range of ICTs (Radio and television stations, Internet, tele-centres e.g.KIRSEC), and they have a diversity of mobile telephone networks. It was assumed that SUA and research institutes (ARIs) in the Districts have been disseminating agricultural information to rural community members in the Districts through communication media in print format such as leaflets and booklets, and video, mobile phones and radio and television stations. In addition, most villages in these Districts were isolated (some were remotely located) and had poor infrastructures especially in Mvomero District. Hence, preferences for different communication media in different isolated villages with varying infrastructural conditions were assessed.

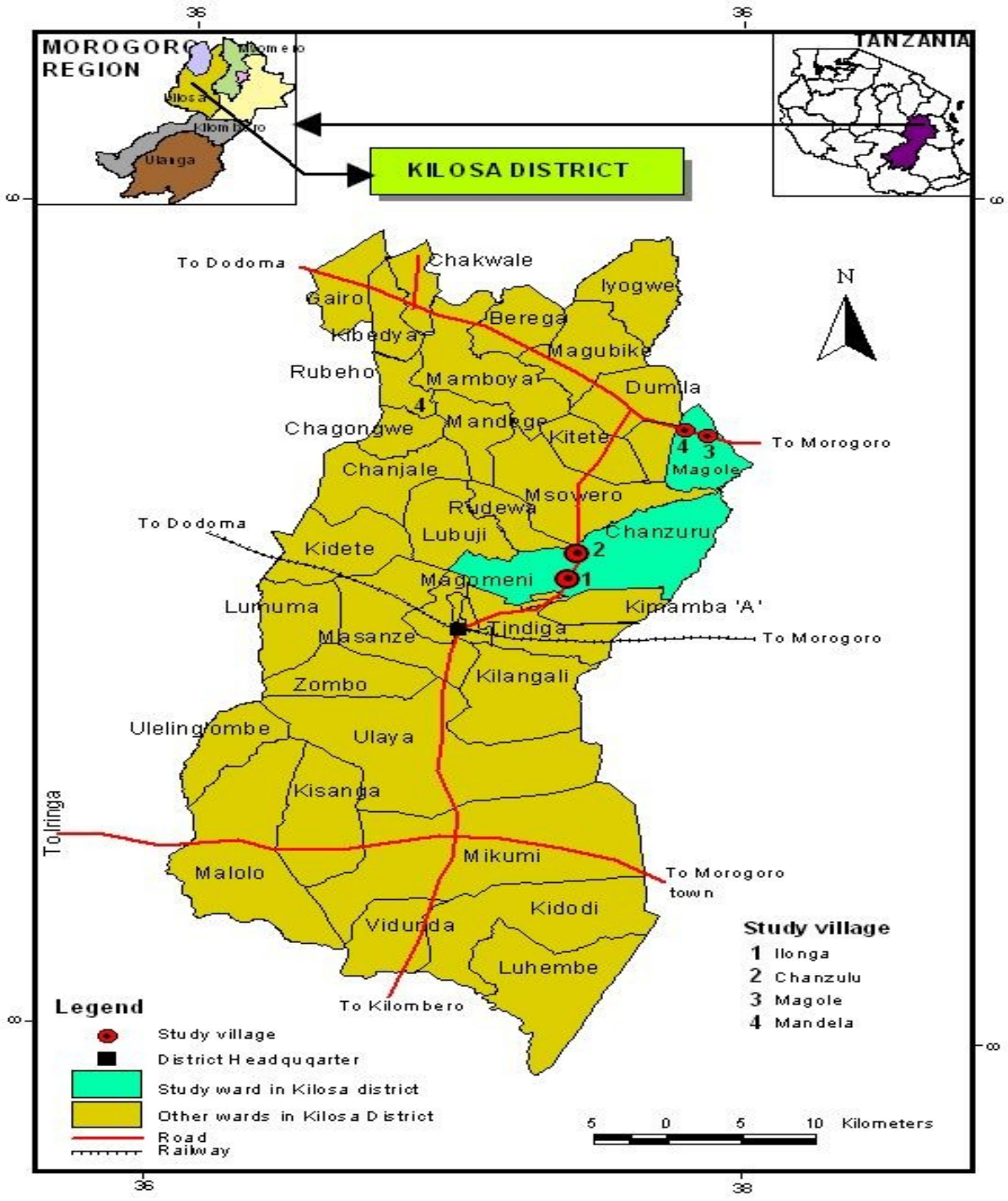
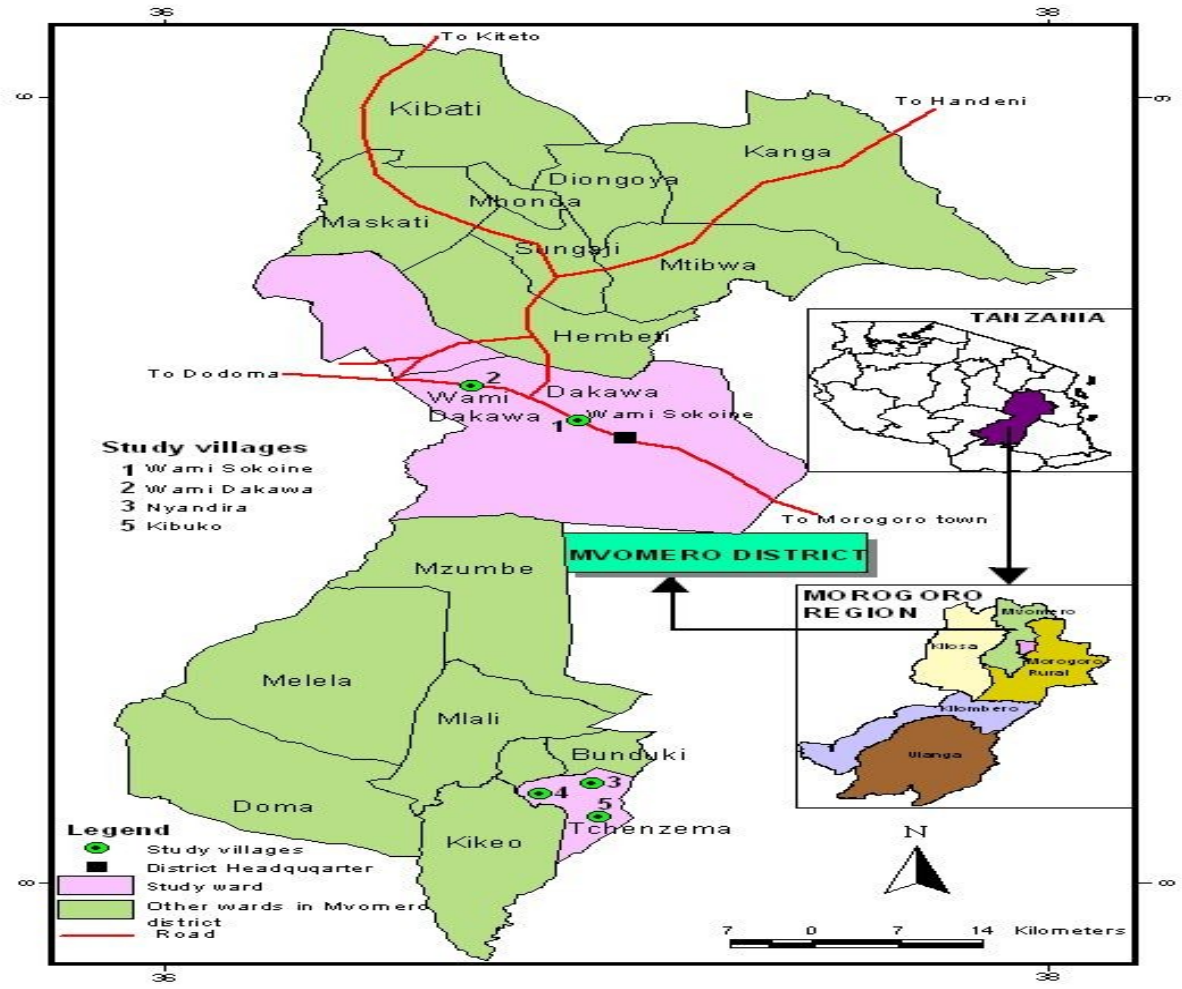


Figure 3: Map of Kilosa District showing location of study villages

Source: GIS laboratory at Sokoine University of Agriculture, 2014



Note: 1, 2, 3 and 5 indicates study villages

Figure 4: Map of Mvomero District showing location of study villages

Source: GIS laboratory at Sokoine University of Agriculture, 2014

3.3 Research Design

A cross-sectional design was adopted for the study. The design allowed collection of data at single point in time from the sample to represent the population. According to Kombo and Tromp (2006); Walliman (2006); Babbie (2007); Rugg and Petre (2007 and Bryman (2012), the cross-sectional design allows the researcher to make inferences about a population of interest at one point in time and enables comparisons

of different variables at the same time. Bryman (2012) asserts that in terms of reliability, validity, replicability and generalizability of results, the cross-sectional design enables the researcher to achieve acceptable results like panel and comparative research designs. Therefore, this design allowed collection of data at single point in time and determination of relationship between and among variables on their influence on men, women and youths preference for communication media in Kilosa and Mvomero Districts.

The study employed a combination of quantitative and qualitative research methods in data collection. These methods include questionnaire survey, key informant interviews, document review and Focus Group Discussions (FGDs). The use of mixed methods in this study is based on two reasons: (i) the present study used mixed methods to gather enough data so as to get indepth information for complementarity and triangulation, (ii) epistemologically, when the research has questions like, what, why or/ and how, mixed methods design is used in the generation of knowledge. These types of questions can apply in both qualitative and quantitative research (Boynton, 2005; Neuman, 2007; Tashakkori and Teddlie, 2010). Therefore, the combined methods (quantitative and qualitative) design was viewed important as what and how types of research questions were used in this study. Both quantitative and qualitative data were concurrently analysed and reported.

3.4 Population and Sampling Procedure

This sub-section describes the population of the study, sampling frame and the procedures involved in selection of sample size.

3.4.1 Population

The population of this study consisted of all small scale farmers in the rural community in Mvomero and Kilosa Districts.

3.4.2 Sampling frame

Sampling frame in this study refers to a prepared list from which the researcher drew a sample. The list was constructed to draw potential respondents. The researcher constructed separate lists of men (above 36 years old), women (above 36 years old) and youths (18-35 years old) from eight villages in Mvomero and Kilosa Districts.The list was constructed based on current records of small scale farmers who are involved in agricultural projects in the village offices (as per extension staff records). It was not possible to use the village registers as the documents lack regular update of information, hence determining number of youth per village could not be feasible, because this is an age shifting gender group. Also community members who are beneficiaries of various agricultural projects were selected from each village with assumptions that they have access to different formats of communication media.

3.4.3 Sampling procedure and sample size determination

The multi-stage sampling procedure was employed. In order to delimit the study area, two districts Mvomero and Kilosa Districts out of six districts in Morogoro Region were selected. From these districts, a total number of four Divisions out of 13 divisions in which four wards (one from each Division) were purposively selected. Then followed by purposive selection of a total number of eight villages (two from each Ward) which include Chanzulu, Ilonga, Magole and Mandela villages (Kilosa

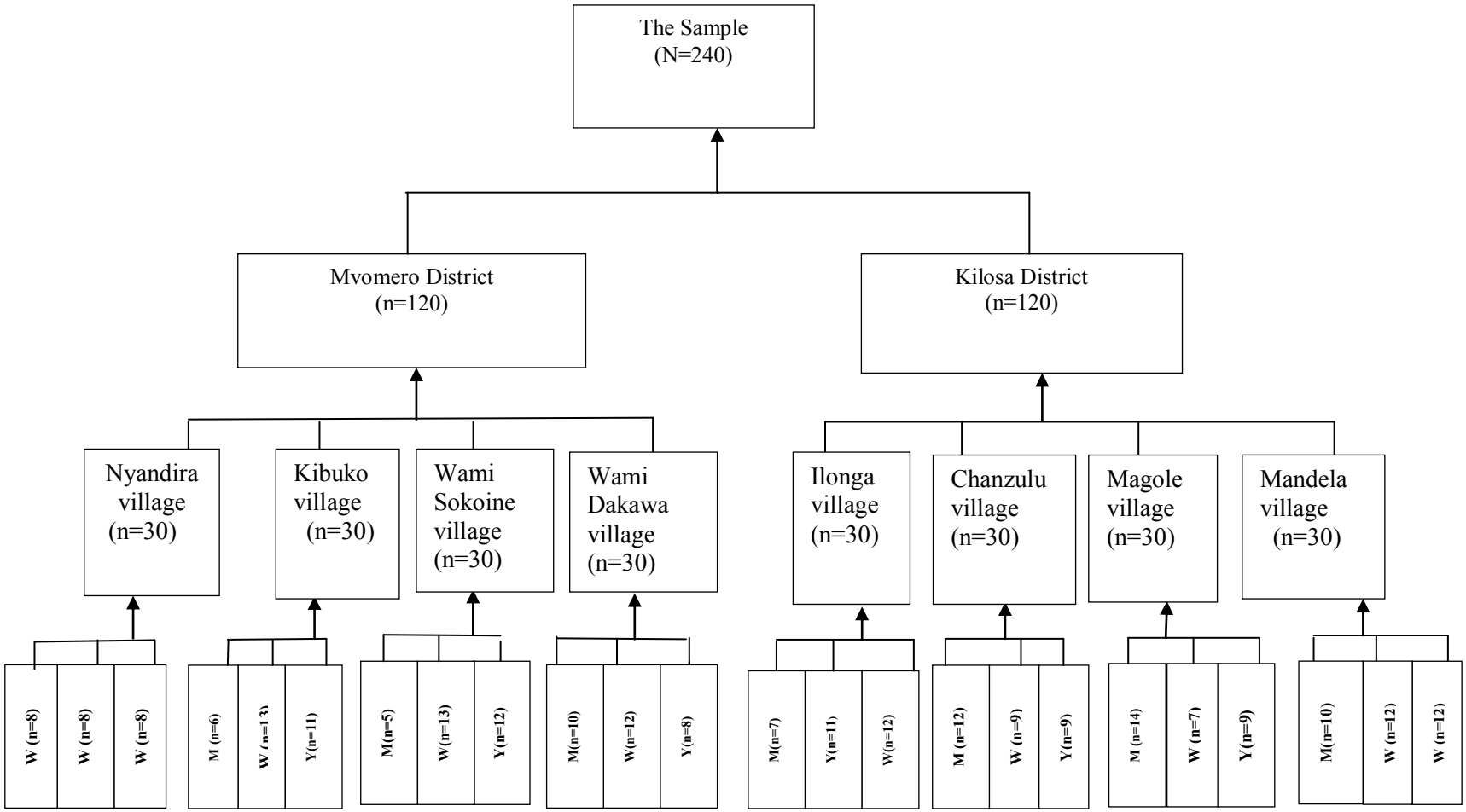
District) and Nyandira, Kibuko, Wami Sokoine and Wami Dakawa villages (Mvomero District).The procedure and criteria involved in the selection of study villages is detailed in Table 1.

Table 1: Sampling procedure

Selection of study areas and number of respondents	Type of sampling procedure used	Justification and criteria of selection
Two Districts (Mvomero and Kilosa Districts) out of six Districts in Morogoro region	Purposive	**Justification for the selection of districts:** Uniqueness in terms of potentiality in agriculture and their close proximity to agricultural institutions and ICTs. According to Morogoro region agriculture sample census results of 2007/2008, about 98.4% of rural households in the districts are involved in agriculture (NBS, 2012).
Eight villages out of 270 villages in Mvomero and Kilosa Districts (four villages per District)	Purposive	**Justification for the selection of villages:** In order to delimit the study area and limited number of development/research projects undertaken in the districts, geographical isolation and state of infrastructural development (road, electricity, etc.) of most of the villages in the districts, hence eight villages were considered to be enough in yielding relevant information. **The criteria involved for the selection of individual villages are as follows:** Nyandira and Kibuko villages (Mvomero District) were selected based on number of agricultural projects that have been implemented in the villages. Additionally, at Nyandira village there is a farmers' centre and a modern market, while Wami Sokoine (predominantly inhabitants are livestock keepers) and Wami Dakawa villages they were selected as they are located along Morogoro-Dodoma main roads and near Chollima Agro-scientific research centre. At Wami Dakawa village there is improved irrigated rice and maize production and a number of projects have been implemented in the village. Chanzuru and Ilonga Msalabani villages (Kilosa District) were selected as they are located near ARI and MATI Ilonga and Kilosa town. At Ilonga Msalabani there is an improved irrigation scheme and an information centre, while Mandela and Magole villages were selected as they are located along Morogoro-Turiani Road and a number of agricultural projects related to horticultural and cereal production have been implemented in the villages.
240 respondents (30 respondents per village) out of 940 agricultural project beneficiaries.	Purposive	**Justification for the selection of 240 respondents are based on statistical requirements and previous studies:** (i) A total number of not less than 30 respondents to be interviewed per village allowed statististal analysis. According to Bailey (1994), a sample size of 30 is the bare minimum for studies in which statistical data analysis is to be done. (ii) Similar studies used 120 to 492 respondents (Oskam and Hudson, 1999; Adomi *et al*., 2003; Fawole, 2006; Nosheen *et al*., 2010; Lwoga *et al*., 2011; Elly and Silayo, 2013). Hence, 240 respondents were considered enough for the study. **Criterion for the selection of respondents:** Respondents were selected based on their involvement in agricultural projects in the study villages.

In determining the representative sample size in study villages, the degree of variability between beneficiaries who are involved in various agricultural projects was considered, hence respondents were purposively selected. A sample size of 240 respondents was purposively selected (30 respondents per village) as indicated in Fig.5. The sample size of 30 respondents per village was proportionately stratified into men, women and youths in each village. The proportionate stratified sampling procedure was adopted based on its ability to allow representative sample. This reduces biasness and ensures balanced views of men, women and youths since they have varied interests and differ in terms of socio-economic status and access to different formats of communication media. In addition, the actual number of respondents[1] in each stratum was obtained after calculation in each village. Then respondents in each stratum were selected through simple random sampling procedure, whereby each respondent had equal chance of being selected.

[1] Notes: The formula used to calculate proportional number of respondents per village;
n/Z x 30=C Where; C=number of men or women or youths that were randomly sampled per village
Z= the total number of project beneficiaries in the village
n= the number of men or women or youths project beneficiaries per village



Key: M=Men; W=Women; Y=Youths

Figure 5: Sample size and distribution

3.5 Development of Data Collection Instruments

In order to guide data collection, data collection tools were prepared. Semi-structured questionnaire was prepared, pre-tested for internal reliability (refer to section 3.8.2) and used to collect quantitative data. In addition, checklists were prepared and used to collect qualitative data through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs).

3.6 Data Collection Procedure

The sub-section describes how data were collected in the study. It provides brief description of primary and secondary data collection methods.

3.6.1 Primary data collection

The following techniques were employed during primary data collection: semi-structured questionnaire, focus group discussions (FGDs), key informant interviews (KIIs) and participant observations.

a) Semi-structured interview

A semi-structured questionnaire (Appendix 1) was developed to guide data collection at household level to achieve objective one to four. The questionnaires were directly administered to respondents in their households or farms by the researcher and trained enumerators. According to Bless *et al*. (2006) and Hesse-Biber (2010), direct administration of questionnaires unlike self-administering of these tools is highly recommended in rural areas in developing countries because of low literacy levels among the population. A total number of 240 community members were involved in

Mvomero and Kilosa Districts. Types of data collected through semi-structured questionnaires are indicated in Appendix 14.

b) Focus Group Discussions

Focus group discussions (FGDs) data collection method was applied as it offers means of exploring and clarifying themes and issues in a given context. In addition, the FGDs method was selected so as to get in-depth views to elaborate on the data collected from semi-structured interviews to explore and clarify issues with regard to communication media preference among men, women and youths. The FGDs were conducted after the analysis of quantitative data so as to provide in-dept information on the research topic. The criteria for selection of participants (men, women and youths) were based on their participation in the semi-structured interview, being resident in the immediate study area and their involvement in agricultural projects for better representation of community members. They were considered knowledgeable to clarify issues raised in the surveys during the FGDs. The selection of respondents with similar characteristics also helped in elaborating hidden issues for ease convergence and comparison of quantitative and qualitative information.

Studies have indicated that FGDs groups might range from ten to fifteen while the size of groups ranges from two to ten people as pointed out by Warr (2005); Bennett *et al*. (2009) and Silva *et al*. (2009), cited by Bryman (2012). In this study, a total number of 92 community members (42 men, 20 women and 30 youth) participated in FGD and fourteen separate FGDs groups of men, women and youths that ranged from three to seven people were conducted. In each village with exception of one village at

least two FGDs were conducted. The number of FGDs and group sizes were considered enough to generate in-depth information as could not deviate from other studies. A checklist was prepared and used during FGDs to collect qualitative information for triangulation purpose (Appendix 4). The types of data collected through FGDs are shown in Appendix 14.

c) Key informant interviews

Key informant interviews (KIIs) were conducted to validate and elaborate on the data collected from semi-structured interviews. A checklist with open-ended questions was designed to solicit information from key informants (Appendix 2). Key informants were purposively selected based on their expertise in communication media research and utilisation. Key informant interviews were conducted with researchers from R &D institutions (Sokoine University of Agriculture, ARI-Ilonga, and Chollima Agro-Scientific Research Centre, Dakawa) information providers (such managers of KIRSEC tele-center, broadcasters-Radio Jamii Kilosa and District Council (Village Extension officers). Others were professionals and researchers who used to implement projects in the study areas such as MVIWATA, Bustani ya Tushikamane, Institute of Continuing Education (ICE)-broadcaster SUA Television, Uluguru Mountains Agricultural Development Project (UMADEP). Finally, a slight modification was made to checklists to fit different categories of key informants during interviews. A total number of 17 key informants participated in the interviews. Types of collected information are shown in Appendix 14.

d) Observation

An observation scheme was prepared and used to guide observation during the study. According to Mack *et al*. (2005); Verschuren and Doorewaard (2005) and Walliman (2006), the observation scheme gives an overview of the subjects that have been derived from research objectives and issues that have to be examined and monitored. The observation scheme helped to collect information to achieve objectives one to four. A list of items observed per village was documented in a specific form as a scheme (Appendix 5).

3.6.2 Secondary data collection

Secondary data were collected from various sources. These data were collected to supplement the primary information for objective one and four. The data sources and type of data collected are shown in Table 2.

Table 2: Sources of secondary data and type of information collected

Data collected	Sources	Location of data source
Availability of communication media in rural areas; population statistics.	Grey and published articles	Sokoine National Agricultural Library (SNAL)
Information on projects' communication strategies; names of districts the projects were implemented.	Reports on past programmes (TARP I and II) SUA, FOCAL, PANTIL) and on-going programme (EPINAV) at SUA	The Directorate of Research and Postgraduate Studies (DRPGS) at SUA
Socio-economic profile of the districts; information on implementation of variuos projects.	Districts profile and annual reports	District Agricultural, Irrigation and Cooperatives Officers' (DAICOs) offices
Information on names of community members involved in various projects to aid sampling.	Farmers' groups minutes	Village government offices
Presentation of information (clarity of messages)	Leaflets and Booklets	Project and non project beneficiaries
Information on category of community members' who access Internet services.	Visitors' registers	KIRSEC, A community tele-centre
Gender and accessibility of communication media; gender indicators.	Research series reports	REPOA
Message receptivity, clarity of messages.	Audiance analysis report	Radio Jamii Kilosa-A community radio station
Information on communication of research results and technologies.	Communication strategies	Agricultural Research Institutes (ARIs) and SUA Libraries
Information on type of available communication media.	Records books	Mgeta Centre for Farmers and Agriculture (CFA)
Information on use of media at rural community level; communication of research results and technologies at rural areas.	Internet	Government and SUA websites

3.7 Data Analysis

3.7.1 Quantitative data analysis

The data from the semi-structured interviews related to questions of when, where, how many and to what extent, were coded and analysed with the aid of the Statistical Package for Social Sciences (SPSS) data analysis software (version 16) (Appendix 14). The procedure undertaken during data analysis to achieve objectives one to four is narrated below:

Objective one: Availability of communication media in rural communities

Data on availability of print, broadcast and electronic media in rural communities was analysed by the Statistical Package for Social Sciences (SPSS) computer software and yielded descriptive statistics such as frequency and percentages that were used to summarise and present quantitative data to achieve objective one. In addition, chi-square test was used to determine the significant associations among men, women and youths on their preference for communication media based on availability of communication media in the study area.

Objective two: Accessibility of communication media in rural communities

Data on accessibility of print, broadcast and electronic media in rural communities were analysed by SPSS computer software to yield descriptive statistics such as frequency, and percentages that were used to summarise and present data, while mean and standard errors were used to summarise relationships between accessibility of communication media and preference for communication media by community members.

In addition, data on socio-economic factors and their relationship on influencing community members' decision in their preference for communication media was analysed by using the Multinomial Logistic Regression (MNLR) model. Through the model, the strengths of relationships between the variables and their influence on community preference for communication media were established. The model was selected as community members had several choices. According to Hill *et al*. (2008), a Multinomial Regression Model allows for analysis of the influence of individual characteristics when people are confronted with multiple choices or preferences. Also the study had both continuous and categorical variables (Table 3) and this model was chosen in order to avoid the problems of multicollinearity related with the use of cross-sectional data. Cross-sectional design was adopted in this study (refer to section 3.3).

The model was further tested for suitability. Results indicated that the Variance of Inflation Factor (VIF) for independent variables was less than ten and standard error for beta coefficients (Table 12 and Appendix 15) was less than two in communication media. The result implies that there was no multicollinearity among independent variables. Again, since the multinomial logit model is already truncated, the test of normality was not performed assuming that dependent variable and data were normally distributed, hence the beta results (coefficients) were realistic (Greene, 2003). In this study, the individual community member preference for communication media due to their accessibility based on socio-economic factors was analysed by the formula:

$$C_{ij}=\beta Z_i+\varepsilon_{ij} \quad \text{.....(1)}$$

Where; $C_{ij=}$ The maximum satisfaction that a community member, "$_i$" derives from preference for communication media; "j^{th}" ; Z_i= is a vector of individual characteristics (socio-economic factors); β=is the parameter to be estimated (coefficients); and ε_{ij}= is the error term. Based on the equation above, the multinomial regression model is specified below:

$$\text{Logit } (C_i) = ln\ (C_i / 1 - C_i) = \alpha + \beta_1 AGE + \beta_2 GENDER + \beta_3 ELCM + \beta_4 ASS + \beta_5 MS + \beta_6 INCOME + \beta_7 TFE + \varepsilon_i \quad \textbf{(2)}$$

Where; $ln\ (C_i / 1 - C_i)$= Logit for preference due to accessibility of communication media= Preference for communication media; α= is the constant term; $C_{i=}$ Preference for radio (Reference group, by default SPSS uses the category with high frequency as a reference group in MNLR analysis); $1 - C_i$=Preference for either television, video tape/DVD, mobile phones, Internet, leaflets or booklets and/or both; β=is the parameter to be estimated (coefficients); β_i=(i=1,2,3,4,5,6); ε_i= is the error term

Independent variables were (Table 2): AGE; ELCM; ASS; MS; INCOME; and TFE. The justification for selection of independent variables is per the literature review in Chapter Two and the dependent variables were: radio=0 (reference group), television= 1, Video tape/DVD =2, mobile phone=3, Internet=4, leaflets=5, and booklets=6. In equation two (2) above, C_i represents the probability of a community member to prefer radio, while $1 - C_i$ represents the probability of a community member to prefer either either television, video tape/DVD, mobile phone, Internet, leaflets or booklets and/or both. The probability that an individual prefers a certain

option is restricted between one (1) and zero (0), ($0 \leq P \geq 1$) (Green, 2003; Hill *et al.,* 2008).

Table 3: Independent variables in the multinomial logistic regression model

S/No	Description of Independent variables	Independent variables in the MLM model	Type of variable	Measure	Anticipated coefficient sign (+/-)
1	Age of community member in farming	AGE	Continuous	Number of years	+
2	Gender of community member	GENDER	Dummy	0=Youth,1=Otherwise	+
3	Educational level of community member	ELCM	Categorical	Years of schooling	+
4	Asset ownership	ASS	Dummy	0=Do not own asset,1=Own asset	+
5	Marital status	MS	Dummy	0=Not married, 1=Married	+
6	Income of community member	INCOME	Continuous	Amount in Tshs.	+
7	Type of farming enterprise	TFE	Dummy	0=Livestock keeping enterprise, 1= Crop farming enterprise	+/-

Objective three: Examination of media content in terms of influencing acceptability of communication media in rural communities

Data on acceptability of media content in rural communities was analysed by SPSS computer software to yield descriptive statistics such as frequency and percentages

were used to summarise data. Chi-square test was used to determine the significant associations among men, women and youths on their preferences for agricultural information from communication media in the study area.

Objective four: Utilization of communication media in rural communities

In order to meet objective four, through factor analysis the SPSS assisted in classfying major constraints related to community members' utilisation of certain communication media that had eigenvalues exceeding 1.0. The eigenvalues exceeding 1.0 and factor loading 0.4 are recommended cut-off point for major factor (Krzanowski, 2007; Field, 2009).

In addition, to test the suitability of the constraints as far as utilization of the communication media is concerned, the Bartletts's test was performed. The test revealed that the selected constraints were highly significant at $p<0.01$ ($p=0.000$) level and the KMO values of 0.777 was obtained. This value was above the recommended point of 0.6 (Field, 2009). This implies proper choice of constraints as far as the utilisation of communication media by community members was concerned.

3.7.2 Qualitative data analysis

The qualitative data dealt with explanatory questions of why, when, what, how and where. They were then categorised, summarised and sorted for data analysis by the computer-assisted qualitative data analysis software (CAQDAS), NUD*IST Vivo (Nvivo) (version 7.0) (Appendix 14). Thematic coding, analysis and interpretation of

the analysed data were done to meet objectives one, two and four. The software was considered useful for this study because of huge qualitative information collected from FGDs, KIIs and observations.Therefore, it facilitated quick, accurate and transparent data analysis.

In addition, to meet objective three, a total of eight articles (booklets and leaflets) (Appendices 10-12) were collected as secondary sources from village and ward offices, and community members and analysed by the researcher through Critical Discourse Analysis (CDA). This method was used to assess the contents of agricultural information (in terms of quality of language used, presentation of message in terms of attractiveness and clarity of messages on media).

According to JΦrgensen and Phillips (2002) in Fig.6, the analysis focused on linguistic features of the text (vocabulary, grammar, syntax and sentence coherence); discursive practice (in the way texts are produced and interpreted) and wider social practice (through exploring links between language use and how should the media content be interpreted by that particular community).

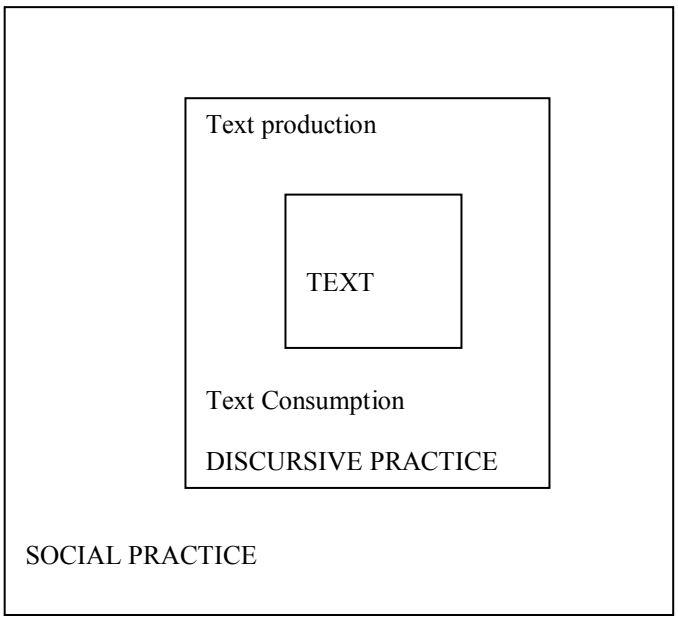


Figure 6: Fairclough's three dimensional model for Critical Discourse Analysis

Source: JΦrgensen and Phillips (2002).

Print media were selected for analysis unlike communication media in broadcast and electronic formats as there is clear evidence that most R&D institutions and information providers traditionally have been disseminating agricultural information through leaflets and booklets to project beneficiaries in rural communities. Therefore, they were easily available in rural areas.

Finally, in order to answer research question in objective three on the extent to which available print media were understandable to community members, the Flesch Reading Ease Formula for readability determination was used. It assisted in analysing the clarity of the messages in terms of readability in print media and results were interpreted as per Flesch Index (Table 4). A total number of eight leaflets and booklets were purposively selected. Details of scores of individual leaflets and

booklets are provided in Appendix 13. The score for each article was calculated by the following Flesch Reading Ease Readability formula:

R.E=206.84-(1.015 x ASL)-(84.6 x ASW).....(3)

Whereby: R.E=Reading Ease; ASL=Average Sentence Length (i.e the number of words divided by the number of sentences); ASW=Average number of Syllables per Word (i.e the number of syllables divided by the number of words). For easy readability, the article should contain shorter sentences and words. According to Flesch (1948) the score between 60 and 70 is largely considered acceptable for easy readability to people with low level of education.

Table 4: Flesch index for interpretation of print communication media scores

R.E score (Flesch Index)	**Appraisal**	**Education level**
0-30	Very difficult	Easily understood by college or university graduates
30-45	Difficult	Easily understood by high school leavers
45-60	Fairly difficult	Easily understood by secondary school or diploma leavers
60-70	Standard	Easily understood by primary education leavers
70-80	Fairly easy	Completed some years of primary education
80-90	Easy	Easily understood by experienced literate
90-100	Very easy	Easily understood by literate

Source: Adapted and modified from Flesch (1948)

3.8 Data Quality Control

3.8.1 Validity

In this study, triangulation was conducted to ascertain and cross-check the validity of information through questionnaire, observations, FGDs and key informants interviews. For example, such measures as using what, why and how questions were undertaken during FGDs and interviews to seek clarifications and avoid biasness. In addition, prior to data collection process the research instruments were checked for content validity. Research supervisors and seven members of academic staff from the Faculty of Agriculture at SUA validated the semi-structured questionnaire. They judged the appropriateness of the content and recommended modifications. Thereafter, corrections were made as suggested. The corrections included wording of questions and their order for comprehensiveness and ensuring that mutual exclusiveness is not violated.

3.8.2 Reliability

The questionnaire was tested for internal reliability. Reliability refers to the degree to which the measuring instrument gives similar results over a number of repeated trials (Field, 2009; Tabachnick and Fidell, 2012). The reliability measure was determined by the use of Cronbach's alpha coefficient (α).The acceptable and recommended minimum Cronbach's alpha coefficient (α) for internal reliability of measurement item for educational research is 0.70 (Gray, 2004; Quinton and Smallbone, 2006; Field, 2009).

The reliability measure was also determined through pre-testing exercise. The questionnaire was pre-tested with 30 community members in Hembeti village of Mvomero District by the researcher. Hembeti village was selected because it has been previously and currently involved in various agricultural research and development projects by various NGOs and R&D institutions, hence has similar characteristics to those in the study villages. After pre-testing, some ambiguous questions were omitted and unclear ones rephrased before the actual survey. Respondents' responses were scored and Cronbach's α for internal reliability established. The instrument yielded Cronbach's α of 0.74 at 0.05 significance level, and this implied that the questionnare was reliable.

3.9 Ethical Considerations

Throughout this study, ethical issues were considered. The SAGE dictionary of social research defines ethical consideration as consent, anonymity, and confidentiality of the research subjects (Jupp, 2006). Prior to the field study, a research clearance letter was sought and provided by the Vice Chancellor of the Sokoine University of Agriculture (Appendices 6 and 7). Then relevant local authorities i.e. Kilosa and Mvomero District Councils provided the permits (Appendices 8 and 9) for data collection in the study villages. While in the study villages, the researcher and enumerators sought for respondents' consent and willingness to participate in the study. Respondents in the study were identified as anonymous and information provided was treated with confidentiality, only for the study. Furthermore, research guidelines and code of ethics in social science were observed such as omitting questions that could bring embarrassment to the respondents, avoiding plagiarism and data fabrication.

3.10 Scope and limitation of the study

The study was limited to Mvomero and Kilosa Districts. The generalization will be confined to those districts. Again, the study focused only on preferences for communication media in print, broadcast and electronic formats by rural communities, hence face-to-face traditional media was not addressed.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This Chapter presents and discusses results based on the specific objectives and research questions of the study. The first section describes the demographic and socio-economic characteristics of respondents; while section two discusses the second objectives of the study that assessed the availability of communication media. The third section presents and discusses the results on the accessibility of various communication media in rural communities. Section four presents descriptive statistics and results on discourse analysis for the acceptability of the content of available print media in rural communities. Lastly, section five provides results on utilisation of communication media in rural communities.

4.2 Demographic and Socio-economic Characteristics of Respondents

This sub-section describes the demographic characteristics such as gender, marital status and education and socio-economic characteristics such as membership in groups/association, household assets, and sources of income of the respondents as captured in the semi-structured interview. These characteristics give an overview of the appropriateness of the study population as far as communication media preference is concerned.

4.2.1 Demographic characteristics

Results in Table 5 indicate that the study population had 35.8% of women, 35.4% of youths (both males and females as one group) and 28.8% of men. In addition, the majority, 76.7% of respondents were married. The results on marriage helped to

explain how preference for communication media in print, broadcast and electronic formats could have been influenced by marital status. This is due to the fact that accessibility of communication media could depend on who owns or controls what communication medium (media) between husband and wife within the households. Furthermore, more than three quarter 80.8%, of the respondents attained primary school level of education. This is a basic level of education for a person to make use of the available simple communication tools such as leaflets, booklets, radio, video, television, and mobile phones.

Table 5: Distribution of respondents by demographic characteristics

Demographic characteristics of respondents		Percentage of respondents (n=240)
Gender		
	Men	28.8
	Women	35.8
	Youth	35.4
Marital status		
	Married	76.7
	Not married	16.3
	Divorced	7.0
Education		
	Primary education	80.8
	Secondary education	12.5
	Post secondary education	1.7
	Not attended formal education	5.0

4.2.2 Socio-economic characteristics

The results in Table 6 show that 57.5% of the respondents were involved in crop farming activities only as their source of income, while a few, 9.6% reported to be involved in other activities such as formal employment (e.g. primary school teachers), shop owners, food vendors, mobile phone prepaid air voucher re-sellers and tailoring. In addition, key informant interviews (KIIs) results indicated that researchers organized farmers into research groups for implementation of agricultural projects as indicated in Box 1. These groups were useful in terms of disseminating communication media in print format (booklets and leaflets) to beneficiaries of those groups. However, quantitative results indicate that 45.8% of the respondents were not members of these groups. It is evident from this finding that most of community members denied themselves an opportunity for access to communication media in print format (leaflets and booklets). Furthermore, results on asset ownership indicate that 45.0% of respondents owned radio, mobile phones and television. These results were important when discussing empirical results in section three to see whether community

Box 1: Research groups as pathways for print media

Researchers under the SIMLESA project organized farmers (men and women) into researchers' groups at Mandela village for maize, pigeon peas and sorghum production. Also SUA, ARI-Chollima and Irrigation Unit Morogoro organsised different age categories of community members into System of Rice Intensification research groups at Ilonga and Wami Dakawa villages. Researchers distributed leaflets and booklets to the chairpersons who later on distributed them to group members.

members' preference for mobile phones and television to radio was influenced by ownership of assets.

Table 6: Distribution of respondents by socio-economic characteristics

Socio-economic characteristics of respondents		Percentage of respondents (n=240)
Membership in groups/associations		
	Women group/association	2.5
	Farmers group/Association	29.2
	Youth group/Association	1.2
	Not a member of any association	45.8
	Others	21.2
Source of income		
	Crop farming activities only	57.5
	Livestock keeping activities only	8.8
	Livestock and crop production activities	24.2
	Other like business, formal Employment or dual activities	9.6
Type of assets owned		
	Means of communication: Radio, mobile phones and TV	45.0
	Land	39.6
	Generator or solar power	12.9
	Do not own asset	2.5

4.3 Availability of Communication Media in Rural Communities

The section presents an overview on the availability and factors that influence availability of different formats of communication media in the study areas. In addition, the relationship between the availability and preference for communication media by men, women and youths in rural communities is discussed.

4.3.1 Availability of communication media in rural communities

The results in Table 7 indicate that radio was easily available to 83.3% of resondents followed by mobile phones to 70.8% of respondents in most of study villages. In addition, communication media such as television, video tapes/DVDs, leaflets and booklets were available with difficulties in the study villages. Results on the easily available communication media in each village was supported by focus group discussions (FGDs) and key informant interviews (KIIs). Qualitative results revealed that few Non-Governmental Organisations (NGOs) such as *Mtandao wa Vikundi vya Wakulima* (MVIWATA)-The Farmers' Groups Network in Tanzania and Technoserve, and researchers used radio and mobile phones as their media of communication with target groups. The Non-Governmental Organisations like MVIWATA and Technoserve use mobile phones to send market information to small scale farmers. MVIWATA sends price information in the form of short message service (SMS) to small scale farmers' mobile phones on various crops from different markets upon subscription to its marketing system, MAMIS-MVIWATA Marketing and Information System. In addition, Technoserve through the support from Bill and Mellinda Gates Foundation support information access in the form of SMS through Tigo-Kilimo initiatives.

Table 7: Respondents' responses on availability of communication media in rural communities

Type of available communication media	Percentage of respondents (n=240)		
	Easily available	Available with difficulties	Not available
Video tapes/DVD	12.9	54.6	32.5
Radio	83.3	12.1	4.6
Television	18.3	47.1	34.6
Mobile phones	70.8	20.8	8.4
Internet	5.0	87.9	7.1
Booklets	10.4	72.5	17.1
Leaflets	14.2	65.4	20.4

It was further reported by FGDs participants that in Magole village (Kilosa District) community members were involved in tomato, sunflower and maize production but village records indicated that tomato production and marketing were the biggest source of income for more than 75% of the villagers. Tomato production requires efficient communication right from input supply, production, management and marketing that could be achieved through the use of mobile phones. This explains why mobile phones were easily available in the village. Also during FGDs at Mandela, Chanzuru and Ilonga villages, participants pointed out that researchers from Agricultural Research Institute (ARI)-Ilonga have been disseminating agricultural information on mixed cropping and soil recapitation through Radio Jamii Kilosa and Radio Abood FM twice a week.

Participants during FGDs pointed out that some communication media were available with difficulties. They said internet was available with difficulties through mobile phones to few community members due to weak signals from mobile phones networks, while in most villages, participants complained of poor wave receiptivity of most television stations. With regard to availability of video tapes/DVDs, it is only two villages Nyandira and Ilonga that reported on availability of video cassettes at farmers' resource center and ARI-Ilonga. Futhermore, community members were seen consulting village and ward executive offices asking for booklets on agricultural production but most offices fell short of them.

Generally, it is evident from these results that of communication media, radio medium followed by mobile telephones was easily available in all study villages in Mvomero and Kilosa Districts, while television, electronic media (video tapes/DVDs and internet) and print media (leaflets and booklets) were available with difficulties in almost all villages

4.3.2 Factors influencing the availability of communication media in form of print, broadcast and electronic in rural communities

Communication infrastructure

The results indicate that the availability of infrastructure such as mobile phone towers and resource centers (farmers' resource centers and video kiosks) in the study villages influenced the availability of electronic (mobile phones, internet and video) and print (booklets and leaflets) formats of communication media. Based on multiplicity of devices internet has become available through mobile phones. Observations from the

field and during group discussions indicated that most of FGDs participants reported that smartphones have found their way in rural areas and few community members own and use them, but it was not established how many community members own them compared to ordinary cell phones.

This result give indicates that internet was available in the study area through mobile phones. In addition, the availability of communication infrastructure, such as farmers' resource centres and video kiosks enabled community members to acquire information from video, hence influenced the availability of video in the study area. For instance, while at Mgeta Centre for Farmers' and Agriculture (CFA) at Nyandira village, video documentaries on dairy goat production, environmental management and networking were seen at the center. Print media (leaflets and booklets) were kept at the village offices and farmers' resource centers, hence made available to villages that had offices and centres. It is only Nyandira and Ilonga villages out of eight villages that had farmers' resource centres.

The results suggest that the availability of infrastructure such as farmers' resource centres influenced the availability of video, print media (leaflets and booklets), while mobile phones towers influenced the availability of mobile phones and internet in rural communities. However, there were few farmers' resource centres in rural communities. This implies that there were few booklets, leaflets and video tapes/DVDs that were available to rural community members through farmers' resource centres for acquisition of agricultural information.

Availability of power sources

The results of the FGDs, KIIs and observations indicate that most of villages had poor access to electricity. Most of them were not covered under the rural electrification programme by the Rural Electrification Authority (REA), while community members in the few villages that were situated along the main roads had little access to national electricity grid. This was due to high charges for electricity and acquisition of electricity poles, and limited access to electricity power due to frequent power interruptions. Although there has been a rapid introduction of solar power technologies in rural areas, most of the respondents in the villages were not happy with the technology. They had negative views on the solar power panels. They pointed out that solar panels have poor durability as they loose their capacity after short use. This poses the challenge on the availability of communication media that depend on electricity.

Basing on the poor access to electricity through rural electricity programme, national electricity grid and unreliability of solar power panels in most villages, implies that communication media in print format (booklets and leaflets) and radio were more available in few villages, while television, video tapes/DVDs, mobile phones and internet were limited in some villages in the study area. This is because; communication media in print format and radio do not depend on the availability of power as compared to communication media in electronic format and television. Similar studies indicated that R & D institutions and NGOs largely used communication media in print format in disseminating agricultural information to project beneficiaries in rural areas (Mbwaga, 2005 and Chilimo *et al*., 2008).

The result suggest that there is a higher chance for communication media in print format (leaflets and booklets) to become available to rural community members who were involved in various agricultural projects in some villages; hence they would be compelled to keep booklets and leaflets to meet their agricultural production information needs.

4.3.3 The relationship between the availability and preference for communication media by men, women and youths in rural communities

Results above indicated radio and mobile phones were easily available in rural communities. Thus, it was of interest to scientifically prove whether the availability of these media significantly influenced their preferences by men, women and youths in rural communities. The results in Table 8 reveal highly significant relationship on the availability of radio and mobile phones and their preferences by men, women and youths in the study area, while there was no significant relationship that was observed on the availability of television, video, internet, booklets and leaflets and their preferences by gender in the study area.

Table 8: Relationships between the availability of communication media and their preferences by men, women and youths in the study area

Availability of communication media	Preference for communication media by gender			Chi-square	p-value
	Percentage of respondents (n=240)				
	Men	Women	Youth		
Video tapes/DVDs	16.7	49.1	34.2	1.117	.773 [ns]
Radio	84.2	10.8	5.0	19.036	0.000*
Television	22.4	54.2	23.4	1.684	.670
Mobile phones	93.3	0	6.7	23.604	0.000*
Internet	5	8.3	86.7	0.648	0.885 [ns]
Booklets	10	15.8	74.2	0.628	0.775 [ns]
Leaflets	13.3	14.2	72.5	5.128	0.163 [ns]

[*]=Significant at p≤0.000; df=7; [ns=] not statistically significant at p≤0.01.

These results are also supported by FGDs and KIIs participants who reported that availability of radio and rapid expansion of the cellphones to rural areas has contributed to the rapid acquisition of radio and mobile phones by men, women and youths in the study area. This corroborates the studies by McNamara (2008) and Sife *et al* (2010) that radio and mobile phones have found their way in rural communities in Tanzania. However, the lack of significant relationship on the availability of video, internet, booklets and leaflets between gender groups in the districts could be attributed to infrastructural conditions and locations of the study villages (refer to the section 3.2). For instance, Kibuko village in Mvomero District is situated in somehow remote environment with limited interactions with outside world and researchers as compared to other villages. This means, the availability of communication media like leaflets, booklets, video and internet could be problematic, consequently on their preference by men, men and youths in this study village.

Results imply that there was a significant relationship on the availability and preferences for radio and mobile phones by gender in Mvomero and Kilosa Districts. In the two Districts (Table 8), while radio was mostly preferred by men and women, it was least preferred by the youth in the Mvomero and Kilosa Districts respectively. In addition, in Kilosa District, mobile phones were mostly preferred by men and youths. However, no woman preferred mobile phones in this district. The variations in preferences for radio and mobile phones among men, women and youths in the districts is an indication of differences of men, women and youths in their ability to mobilise financial resources in acquisition and meeting the operational costs of mobile phones and radio in the study area. Hence, it can be inferred that non-preference of mobile phones by women in Kilosa District based on their availability was attributed by costs related to their operation. Respondents claimed that the availability of mobile phones and its preference for use depends on how one could meet additional costs associated with use of mobile phones such as buying mobile phones, buying recharge vouchers, mobile phones repair and battery recharge costs.

For instance, the FGDs participants reported that most women in the study area in Kilosa District were married and not involved in non-farm activities like business, charcoal burning and casual labour unlike men, who were heavily involved in both on farm activities and non farm activities, hence had additional income to buy mobile phones and meet operational costs. They were also motivated to prefer mobile phones based on availability as their means of communication since the medium was also used to access market information and in business transaction.

Most women in the study area in Kilosa District spent most of their time in farming and use farm income to buy food and other neccessites for the family, while men

were reported to spend less income to meet family needs. That means, since women were not involved in non-farm activities, they did not have additional income to spend on mobile phones. This explains why based on the availability of mobile phones, women did not prefer them as could not use their family's income for other expenses such as buying mobile phone recharge vouchers, battery recharge and repair costs. This result concurs with the study by Mwakaje (2010) who found that use of information communication technology (ICT) especially mobile phones to access markets was significantly related to income level.

Finally, quantitative and qualitative results imply that the availability of mobile phones and sources of income has influenced women in Kilosa District in their non-preference for mobile phones. Therefore, the results suggest that any initiatives to increase availability of mobile phones to enhance their preference by women for acquisition of agricultural information should be linked with efforts to increase sources of income, for example non-farm activities to women in rural areas particularly in Kilosa District.

4.4 Accessibility of Print, Broadcast and Electronic Media in Rural Communities

This section discusses the accessibility of communication media in the study areas. It highlights the accessibility of communication media in print, broadcast and electronic format to men, women and youths. In addition, it describes factors influencing the accessibility and relationship between the accessibility and preference for communication media by gender in the study area.

4.4.1 Accessibility of communication media in the study area

Results in Table 9 indicate that 50.3% of the respondents had access to radio, while internet was least accessed by 0.14% of the respondents. The results imply that radio medium was the most accessible in the study area. During the FGDs participants pointed out reasons as to why the majority of respondents in rural communities had more access to radio than to any other communication media as their tool for information sharing. These include its independence of electricity where batteries could be used or air vacuum, its portable nature as could be carried everywhere, for example in house, in the field, market places, etc. and its multiple use especially for acquisition of information, entertainment and for lighting at nights.

Table 9: Type of accessible communication media in the study area

Type of accessible communication media	Percentage of respondents (n=240)
Video tapes/DVDs	4.2
Radio	50.3
Television	14.2
Mobile phones	17.6
Internet	0.4
Booklets	5.4
Leaflets	7.9

Again, it is important to note that results under section 4.3.2 indicate that communication media in print format were more available in some rural communities than television; hence it is an expected finding that booklets and leaflets would be more accessible than television. However, the results in Table 9 indicate that

television was more accessible to 14.2% of the respondents than booklets and leaflets in rural communities. Evidence from FGDs and observations indicate that most of booklets and leaflets were kept in the few available farmers' resource centres and records on registers indicate that few men, women and youths visited these places to access them. Hence, communication media in print format were accessible to few men, women and youths in the rural communities that had farmers' resource centres. This implies that television was more accessible in study villages that did not have farmers' resource centers and to those who did not visit farmers' resource centres.

4.4.2 The relationship between the accessibility and preference for communication media by men, women and youths in rural communities

The researcher tested the interaction between two subjects: the influence of accessibility of communication media and preferences for communication media by men, women and youths, versus the influence of gender to preference for communication media. The model in Table 10 tested whether there was significant interaction between accessibility and preferences for communication by men, women and youths, and the influence of gender to preference for communication media or not in rural communities. Since the value for gender and accessibility to communication media might be orthogonal, the model corrected the orthogonality by reporting type III sum of squares to correct the effect of each variable evaluated.

The results in Table 10 indicate that there was a statistically significant difference of interactions of means at $p \leq 0.016$ between the accessibility of communication media and their preferences by men, women and youths in the study area. However, tests on the influence of gender to preferences for communication media among men, women

and youths in Mvomero and Kilosa Districts could not find statistically significant difference at $p \leq 1.000$. This means, because of being mostly accessible (Table 9); the radio is preferred by men, women and youths in the study area. These results corroborate with Lwoga *et al*. (2011) and Rodriguez *et al*. (2015) that found that radio was the most preferred medium in rural communities in accessing agricultural knowledge and information. In real practice, it could be expected that the multiplicity of devices have influenced the interaction between communication media. It was expected that community members' likelihood to choose mobile phones to radio as their most accessible medium in the rural community could be high. This is because they could access mobile phone and radio, television and internet together, however results are different. This suggests that the qualitative result under section 4.4.1 on the portability, multiple uses of radio and its independence of electricity is valid in rural areas. This means, based on the extent of obtaining communication media at the time is needed due to its portability nature, multiple uses of radio and its independence on electricity radio was mostly preferred by rural community members. In addition, qualitative results did not reveal interaction between mobile phones and radio in terms of frequency of community members' access to radio, internet, video and television in acquisition of agricultural information through mobile phones.

Table 10: Interaction test between the influence of accessibility and gender on preference for communication media in study area

Source	Type III sum of squares	df	Mean Square	p-value
Corrected model	5606.891[a]	10	560.689	0.072
Intercept	7151.431	1	7151.431	0.000
The influence of accessibility of communication media on preferences for communication media	5606.887	7	934.481	0.016*
The influence of gender (men, women and youths) on preferences for communication media	0.005	3	0.001	1.000ns
Error	6535.607	24		
Total	19293.930	35		
Corrected Total	12142.499	34		
Corrected model	5606.891	10	560.689	0.072

[a] R Squared = 0.462 (Adjusted R-Squared = 0.237); *=statistically significant at $p \leq 0.05$; ns= not statistically significant at $p \leq 0.05$.

The relationship between the accessibility and preference for communication media implies that, preference for a certain communication medium in the rural community is influenced by its accessibility to men, women and youths. There was no direct relationship on the state of being a man, woman or youth that could compel him/her to prefer such a medium. This confirms one of the assumptions on the Preference Theory based on the total preference that assumes that individuals, in this context, consumers of the communication media have consistent behaviour. If one communication medium is preferred in one situation, the preference could not be altered in another situation. Therefore, the accessibility of a communication medium to men, women, and youths influences their preference for radio medium, not different communication media based on their gender category or locations in Mvomero and Kilosa Districts.

Finally, the results suggest that effort to avail information in the rural communities should focus on the most accessible communication medium in the locality and take advantage of its accessibility to men, women and youths. For instance, if a certain radio station is heard in the location, it implies that men, women and youths are likely to get access to that station. Therefore, agricultural information should be disseminated through that radio station.

4.4.3 Factors that influence community members' access and preference for communication media in the rural community

Socio-economic factors influencing access and preference for communication by community members

This section discusses results of the socio-economic factors such as age, gender, education level, asset ownership, marital status, income level and type of farming enterprise and their influences on community members' decisions to prefer communication media. Socio-economic factors and their probability on influencing community members' decisions making to prefer certain communication medium over the most accessible medium were examined using multi-nomial logistic regression model. Results in Table 11 reveal that probability of the final model chi-square (99.88) of the selected variables in the model was statistically significant at $p \leq 0.05$, ($p=0.014$). Moreover, the odd ratios were greater than one (Table 12). This implies that independent variables explained well the dependent variable; hence there is existence of relationship between independent variables and dependent variable. The model has been tested using adjusted R-squared (Pseudo R^2) for Nagelkerke, Cox and Snell and McFadden (Table 12). The value of Pseudo R^2 meant that the

observed differences could be explained by independent variables in the multinomial model while the remaining percentages could be explained by other factors. The obtained value was below 50% and was considered to have good fit as it explained well the variation of independent variables in the multinomial model (Refer to equations one and two in section 3.7.1). These results are supported by Garver and Mentzer (1999) and Hill *et al. (*2008) that unlike the R-squared in Ordinary Least Squared (OLS) logistic regression, any obtained R-squared value is satisfactory in the multinomial logit.

Table 11: Model fitting information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	p- value
Intercept Only	557.542			
Final	457.657	99.885	42	0.014*

Likelihood Ration value = 17.32; *=statistically significant at p≤0.05

Results in Appendix 15 indicate that out of seven socio-economic factors examined, two factors had positive and significant influence on community members' preference for communication media at p≤0.01. These factors were education level and income level of community members. In addition, only two variables namely marital status and type of farming enterprise had positive and positive/negative signs respectively for all communication media in co-efficients as expected. The positive sign for all communication media in marital status variable suggests that the

preference for more than one communication medium would be achieved from the use of additional quantities of this variable, *ceteris peribus*. This could be increasing the involvement of more number of married, widows or not married respondents in the study.

Table 12: Estimated results of leaflets and television in the multi-nomial logistic regression model (Radio is the reference choice category)

Variables	Leaflets				Television			
	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)
Intercept	-11.618	0.360	0.000	-	3.028	2.229	0.054	-
AGE	0.481	1.10	0.661 ^{ns}	-1.677	11.839	0.97	0.984 ^{ns}	1.386
GENDER	-0.485	1.72	0.777 ^{ns}	-3.849	-11.516	0.99	0.990 ^{ns}	6.789
ELCM-PE	16.051*	1.26	0.000	13.582	10.903	1.28	0.973 ^{ns}	5.432
ELCM-SE	18.908*	1.96	0.000	15.068	11.627	1.39	0.971 ^{ns}	1.121
ASS	-1.465	0.63	0.249 ^{ns}	11.870	0.499	0.63	0.775 ^{ns}	-2.926
MS	0.939	1.19	0.430 ^{ns}	-1.393	10.604	0.79	0.970 ^{ns}	6.705
INCOME	3.19e-08	1.49	0.645 ^{ns}	-1.04e-07	2.13e-07*	0.57	0.003	7.08e-08
TFE	-0.509	0.72	0.477 ^{ns}	-1.912	-0.524	0.59	0.592 ^{ns}	1.637

Number of observations=240; Degree of freedom (df) =42;

Adjusted R-squared: Nagelkerke R.Square=0.360; Cox and Snell R.Square=0.340; McFadden R.Square=0.142

Statistical significance: * statistically significant at p≤0.01 level; ^{ns} not statistically significant at p≤0.05.

Key: AGE= Age of community member in farming; GENDER= Gender of community member; ELCM= Educational level of community member; ELCM-PE: Educational level of community member, primary education; ELCM-SE: Educational level of community member, secondary education; ASS= Asset ownership; MS=

Marital status; INCOME= Income of community member; TFE= Type of farming enterprise community member involved in.

(i) The influence of education level on preference for communication media

Results indicate that the co-efficient of education level especially primary and secondary education levels was positive (Table 12). The significant relationships between preference for leaflets over radio and education level of the community member was highly statistically significant at $p \leq 0.01$, ($p=0.000$). The statistical significance of the variable explains the importance of education level in the preference for leaflets, meaning that illiteracy would not only pose negative effect on the preference for leaflets, but also has indirect negative effect on the acquisition of agricultural information, hence affecting agricultural productivity. In Tanzania, the cancelation of literacy classes for adult has negative repercussion for community members who do not know how to read in preferring leaflets for acquisition of agricultural information.

The positive relationship between education level and probability that community member prefers leaflets over radio could also be explained in terms of motivation. As the community member attains more years in his/her education, this motivates him/her to recognise the value of information on communication media in print format. Thus, this derives his/her preference for leaflets over radio. The rise of odd ratio from 13.58 to 15.07 implies that as the number of years in schooling increases from 13.58 years in primary school to 15.07 years in secondary education levels, the community member's likelihood increases to prefer leaflets than radio. This is based

on the fact that community members who spend more years of schooling are acquinted with printed words on papers in their struggles to accomplish educational purposes; hence they are used to print media and could have developed interest on written words. Therefore, the community member is likely to increase his/her motivation to prefer leaflets than radio as his/her educational level increases by 1.5 years.

The observed positive sign followed the same pattern as predicted. This holds for leaflets, booklets, television and mobile phones with the exception of videotape/DVDs and internet communication media that indicated negative co-efficients. The negative sign in co-efficients for video tapes/DVDs (-1.05) and internet (-17.51), however, could explain the reliance of community members on leaflets for acquisition of agricultural information. Therefore, the increase of education level of the community member by 1.5 years decreases community member preference for video tapes/DVD and internet by approximately one percent and 18 percent respectively. The results suggest that the number of years the community members spend in school is more likely to increase his/her proactiveness in information search from leaflets over radio, video and internet that could not be possible if he/she had low level of education.

ii) The influence of income level on preference for communication media

The co-efficient of income level was positive for leaflets, video tapes/DVD, mobile phones and television (Table 12). The probability of a community member to prefer television to radio in relation to his/her level of income was positive and significant at

$p \leq 0.01$, (P=0.003). The value of odd ratio which is greater than one (7.08) supports the higher probability that income variable influences community members in their preference for television. The positive sign of income in television media is an indication of association to increasing costs related to television and it is determinant of how much it is incurred in buying and operating television on daily basis. This means the higher the rate at which the daily requirements to operate television are met, the higher the likelihood for community member to prefer television.

To illustrate this, in real practice, evidence indicates that the community member who owns television incurs four types of costs at a time: firstly, cost for buying television set (screen and DVD player); secondly, cost for electricity or solar panel installation; thirdly, electricity charges (for those connected with national electricity grid) and fourth, buying satellite dishes/decoder (in the year 2013, a satellite dish and its connector cost TAS 90,000/=) with monthly subscription fee for the decorder.

Box 2: Zuku Content Seller/Producer Statement
Here at Zuku we aim to make affordable, high quality home entertainment available to a rapidly growing, choice conscious and underserved East African middle class.We have numerous of channels like Zuku Entertainment, Zuku Life, Zuku Movies Max, Zuku Sports just to mention but a few which bring you programs like Statehouse, Groove Theory, Mentality, Hyped East Africa, Afro Fuse, Tales from the bush ladder. The programs range from cooking shows to dramas to movies to sports etc

Source: Zuku, (April, 2015). Content producers. [http://www.zuku.co.tz/about-zuku/zuku-content-seller-producer] site visited on 13/04/2015.

Based on the results, it could therefore be argued that the preference for television by rural community members with low income status is likely to be hard to sustain, since community members must pay twice-once for buying sets/accesories and for others on continuous basis (companies-electricity/subscription fees). This argument is strongly supported by Zuku Entertainment Company on its website that television is for middle/higher income earners (Box 2).

Therefore, the positive relationship between the amount of income and probability of preferring television can be explained by the fact that if the community member has higher income, he/she becomes motivated to prefer television. This is because the amount of income the community member has would enable him/her to incur costs related to television and its operation. For instance (Table 12), as the income of community member increases by 0.3 percent it increases his/her chances twice on likelihood to prefer television rather than radio. In addition, as his/her income increases by 0.3 percent, this would enable him/her to meet approximately two percent of costs related to television and its operation.

The result on positive relationship between the amount of income and probability on the preference for television by the community member is also supported by the mean income of respondents who mentioned television as a communication medium of their preference in Table 13. It means that as the community member attains an average annual income of TAS 2,482,353/= would prefer television over any other communication media. This implies that the preference for television was influenced by the increase of community member's income. Therefore, the results provide clear

evidence that income variable influences community members' preference for television over radio. The results suggest that low income earners they always prefer radio for acquiring agricultural information over television. Furthermore, the Preference Theory assumption which states that as the income increases, the purchasing power increases, hence an ability to increase preferences for more than one medium did not hold true.

Table 13: Mean annual income of respondents basing on communication media of their preference

Type of communication media preferred	Mean annual income in TAS.
Video tapes/DVD	2,168,939
Radio	1,496,038
Television	2,482,353
Mobile phones	1,110,349
Internet	1,400,000
Booklets	199,091
Leaflets	850,000

Finally, contrary to the expectations, income was not statistically significant. It revealed inverse relationships on its influence to community members' preference for booklets and the internet. As the income of the community member decreases by two percent, he/she would prefer booklets and the internet. This could be explained by the fact that access to booklet requires one time cost whereas accessibility of internet for instance through smartphones requires mobile phone airtime.

(iii) The influence of type of farming enterprise on preference for communication media

It was anticipated that type of farming enterprise would positively or negatively influence community members on their preference for communication media. Results indicate that the type of farming enterprise was found to influence community members' negatively on their preference to most of the communication media with the exception of the internet (10.24) that had positive co-efficient (Appendix 15). Again, this variable had almost half of the communication media having an odd ratio of less than one. It implies that it was an important variable in influencing community members in their preference for booklets, leaflets, video, internet, television or mobile phones than radio but could not be proved statistically.

The odd ratio of farming enterprise variable explain the importance of agricultural information in agricultural production although the variable was not statistically significant at $p \leq 0.477$ for leaflets; $p \leq 0.295$ for booklets, $p \leq 0.592$ for television; $p \leq 0.942$ for Internet, $p \leq 0.695$ for mobile phones and $p \leq 0.789$ for video tapes/DVDs. In addition, community members' negative preference for the most of the communication media is explained by the type of crops grown by community members. The results imply that the type of farming enterprise undertaken by the community members influences him/her negatively on the preference for booklets, leaflet, video tapes/DVDs, internet, television or mobile phones for acquisition of agricultural information. Though there was no statistical evidence to prove this, the results on ranked crops based on the need for information show that rice was ranked high in terms of need for information followed by maize, while vegetables (such as

cabbages, tomatoes, onions, etc.) were ranked somehow important and other crops e.g. sunflower were ranked as least important crops (Table 14).

It was expected that high value crops such as horticultural crops could be ranked high in terms of information requirements as they are managed differently from other crops due to their perishable nature and vulnerability to pests and diseases and therefore needed timely information, but this was not the case as predicted. This explains the negative co-efficients on preference for booklets, leaflets, video, television and mobile phones. The results suggest that the highly ranked crops were of supply driven nature, hence community members could not be motivated to prefer booklets, leaflets, video, television, mobile phones over radio in acquiring agricultural information related to production of these crops.

Table 14: Ranking of the crops with regards to need for information by respondents

Ranking of the crops based on information needs	Percentages of respondents on type of crops grown by respondents (n=239)				
	Vegetable Crops (e.g. tomatoes, onions,)	Maize	Rice	Sweet potatoes	Other crops like sunflower, legumes etc
1. Most Important	19.4	44.6	48.2	0	6.6
2.Very Important	17.3	26.4	23	2.0	17.2
3.Important	22.3	6.7	9.4	22.0	17.2
4.Somehow Important	17.3	3.1	12.2	32.0	12.3
5.Least Important	23.7	8.3	7.2	44.0	46.7

(iv) The influence of age, gender, marital status and asset ownership on preference for communication media

Gender variable was not statistically significant and had positive co-efficient sign for booklets, internet and mobile phones as expected, but negative sign was observed for leaflets, video tapes/DVDs and television (Appendix 15). However, the positive sign on the Internet and mobile phones could be explained by the fact that mobile phones have found their way into rural areas and farmers have access to them. Recently, due to technological changes, community members especially the youth in rural areas own smartphones through which they could get access to radio and television programmes, internet and video. Hence, these youths could find less need for buying television and video tapes that require additional costs. In real life, youths as life beginners seem to consider cost reduction as a priority. For instance (Appendix 15), the youth' s investment of five percent of his/her income for buying mobile phone leads to cost reduction for operational costs related to television and video by seven percent. In terms of women access to the internet, they are disadvantaged in terms of accessing information from that medium. Information from key informants verified their vulnerability in terms of access to information on the internet. The Kilosa Rural Electronic Services (KIRSEC) manager commented that:

"Women are more affected in information access on the Internet. On average 10 women out of 35 people do register to use the Internet services at the tele-centre daily" (KII 2, Kilosa town).

In addition, positive influence on preference for booklets could be explained by the fact that booklets are more storable than leaflets. In normal practice, a booklet can be

easily stored as compared to leaflet. Results in Appendix 15 indicate that the accessibility of booklets to women by 16% reduces their motivation to keep leaflets by four percent. Therefore, the value attached to leaflets decreases. This has an implication for women in rural areas to value a booklet over a leaflet.

Age variable was not statistically significant and had positive co-efficient sign for booklets, leaflets, television, and internet as expected (Appendix 15). The positive co-efficient on booklets, leaflets, television and internet implies that as the age of a community member increases, the member becomes proactive to search for information to diversify farming activities as his/her livelihood's option, and therefore becomes motivated to search for more agricultural information from different communication media to improve his/her farming activities to meet the family's food and income needs.

Negative sign was observed for mobile phones (-1.558) and video tapes/DVDs (-0.33). Therefore, negative sign signifies that as a community member spends less than three months and two years as a beginner in farming enterprise (crop or livestock in farming enterprise) his/her dependency on video tapes/DVDs and mobile phones for agricultural information acquisition decreases by 0.33 percent and two percent respectively. This implies that he/she could have not have accumulated enough experiences, hence reduced dependency on video tapes/DVDs for information acquisition, hence increased frequency for consultation with the extension officers/livestock officers and fellow farmers who have been engaged in the same farming enterprise for long time. The result on age contradicts with the study by

Rashid and Elder (2009) who found that as the age of a community member decreases, she/he was likely to prefer mobile phones to other communication media in acquiring agricultural information.

Finally, asset ownership variable was not statistically significant and had positive co-efficient sign for television and internet as expected, but negative sign was observed for booklet, leaflets, video tapes/DVDs and mobile phones (Appendix 15). The results imply that television and internet do not require one time cost, therefore a community member with more financial resources prefers television than radio to get up to date agricultural information. He/she would be able to meet operational costs and visits to internet café or buy bundles for internet access on regular basis, while a community member with fewer resources prefers booklets or leaflets or video tapes/DVDs or mobile phones

Costs related to acquisition of communication media

Results in Table 15 indicate that the majority, 73.6% of respondents in the study area had access to mobile phones and radio as compared to other communication media through buying them. The results means that cost are involved in acquiring and accessing mobile phones and radio. For instance, observations in the field and FGDs discussions indicated that smartphones have found their way in rural areas and the community members had access to them. They also use them to access internet services. However, it was not established how many community members own smartphones as compared to ordinary cell phones.

Table 15: Means through which respondents get access to available communication media in the study area

Means of accessing communication media	Percentages of respondents (n=240)
Buying (eg. mobile phones and radio)	73.6
Interpersonal relationships (e.g.neighbours, researchers, etc.)	17.6
Others e.g. borrowing	8.8
Total	100.00

The qualitative results as per FGDs and KIIs further indicate that community members used mobile phones to afford interaction with researchers, extension staff, agro-dealers and buyers. To illustrate, they could call directly the agro-dealers to inquire about the arrival of new crop variety/pesticides/insecticide or could call directly to buyers, or relatives and friends to confirm prices they were given by middlemen in the village. Also, they communicated the supply and demand information to local or other markets in Morogoro municipality or distant markets in other regions for decision making on where to sell their produce.

The results suggest that there is costs related to accessibility of mobile phones in rural communities and the medium is largely used by community members in business transactions. This means, community members who have additional income to buy mobile phones and meet operational costs such as buying mobile phones recharge vouchers, maintenance and battery recharge costs are likely to have access to the mobile phones in rural communities.

Location of the community

Qualitative results indicate that location of the community members influenced the accessibility of communication media. In most cases community members in the study areas used to receive leaflets from local extension officers, neighbours and relatives as gifts, and researchers who visited their areas or doing participatory trials in their localities. This was made possible on the accessibility of the village to the external world, in terms of road condition. Good network of the roads facilitates easy transport of extension officers, researchers and other professionals to the village and vice versa. In addition, the location of village near resource centres such as farmers' centres helped few community members to access to communication media in print format e.g. booklets and leaflets (Plate 1).

Plate 1: Picture displaying accessible print media at Mgeta Center for Farmers and Agriculture (CFA)

The accessibility of communication media (mostly booklets) to community members due to their close proximity to farmers' resource centres, research centres, etc. was verified by the village extension officer at Ilonga village:

"*Community members especially farmers get access to booklets communication media at their proximity from different sources such as farmers' resource centres, researchers, relatives and as gifts from their parents. Hence, dissemination of technology is rapid. In addition, many farmers can practice themselves in their farms the knowledge they obtained from communication media"* (KII 2, Ilonga village).

However, qualitative results from FGDs and KII revealed that some communication media on agricultural production especially video tapes/DVDs and booklets were not readily available in most villages (especially those who had no farmers' resource centres). The FGDs participants said that they had to travel long distances to search for these communication media. In addition, FGD participants reported that some of the stations had poor receptivity in some villages. For instance, most radio stations, such as, Abood FM radio, Radio Free Africa and TBC1 in Wami Sokoine, Mandela, Kibuko, Ilonga and Nyandira villages had poor receptivity, consequently community members did not know the time for airing development programmes such as agricultural programmes. Similar results were observed in the study by Fawole (2006) and Sanga *et al*. (2013) who found that poor timing of agricultural programmes in radio stations affected rural people in terms of access to radio programmes especially on agricultural information.

Lastly, the FGD participants indicated that the majority of community members in the study areas subscribed to mobile phone services. However, the observations from remote areas indicated that vodacom network had a poorer coverage as compared to Airtel and Tigo mobile phone services.

4.5 Contribution of Media Content in Influencing Acceptability of Communication Media by Community Members in Rural Communities.

This section discusses the acceptability of communication media in terms of their content. It starts by establishing the readability of print media (leaflets and booklets) in the study areas. Then, factors influencing acceptability of content of the media are discussed.

4.5.1 The extent of readability of print media in the study areas

Analysis of booklets and leaflets that were purposively sampled in the study areas indicated the Flesch Index of 54.99 (Appendix 11). The results imply that texts in the articles had longer sentences (average of 24 words per sentence) and words (average of 9 syllables per word); hence the majority of community members had problems in understanding the leaflets and booklets as found in the study areas. According to results in Table 4 on the interpretation of the Flesch index, it means the leaflets and booklets were fairly difficult, hence could not be understood by community members with low level of education in the study areas (Table 5). It is only community members with ordinary level secondary education or diploma training who could read and understand information presented in these leaflets and booklets. These results hold that the available leaflets and booklets were acceptable to only few community members.

The evidence from FGDs indicates that poor readability of articles in print media could be attributed to lack of pretesting. Otherwise, they could be modified to suit community members' level of education and taste. It is only one study that was conducted in one of the study area by Mgumia (2001) which involved villagers in poster production. However, results from FGDs and KIIs did not indicate the involvement of beneficiaries in the pretesting of the communication media under investigation of the leaflets and booklets.

Finally, this finding can not be generalised. It is only applicable in the study areas (Mvomero and Kilosa Districts), since a purposive sampling technique was used to select articles on agricultural information for analysis. In other studies, for example Matovelo (2008) found that those who knew how to read and write understood the leaflets intended for them very well. However, this could be attributed to the type of leaflets that were available to the community at a particular time based on information presentation and content.

This study's contributation is rather on media discourse research. A number of previous attempts to Critical Discourse Analysis (DSA) research measured audience views by simply considering whether the message presented was true, complete or error free. This made it difficult to tell to what extent the content affected readability of certain print media in the study areas. This study, however, established the Flesch index on the readability of print communication media that has never been established in the study areas (Mvomero and Kilosa Districts).

4.5.2 Factors influencing acceptability of communication media based on content in the rural community

Type of agricultural information

Results indicate that most of the respondents' responses indicate that they preferred agricultural information from the communication media (Table 16).

Table 16: Type of information sought by respondents from communication media

Type of information accessed through communication media	Percentage of respondents on type of communication media they accessed information (n=230)						
	Video tapes/ DVD	adio	Television	Internet	Mobile phones	Booklets	Leaflets
Entertainment information	0	9.6	3.0	6.4	0	0	0
Health related information	0	0.9	0	2.1	0	0	0
Agricultural information	60.0	54.4	63.6	63.0	100.0	100.0	94.1
Religious information	10.0	3.5	3.0	0	0	0	0
Entertainment, Health, agricultural and religious related information	20%	22.9	21.1	17.0	0	0	5.9
Others , eg.news	10.0	8.8	9.1	10.6	0	0	0

In addition, the results in Table 17 indicate that there was a statistically significant relationship at $p \leq 0.004$ among men, women and youths, and their preferences for agricultural information from communication media in the study area. The variation in relationship was brought by youths who indicated their least preference for information on value additions (1.7%). The result implies that men, women and youths have different agricultural information needs. These results corroborate those of Elly and Silayo (2013) that had shown that community members in rural areas have varied agricultural information needs.

Table 17: Type of agricultural information preferred by men, women and youths in study area

Type of preferred agricultural information	Percentage of respondents (n=168)		
	Men	Women	Youths
Market information	28.1	23.2	39.0
Crop husbandry information	53.1	39.5	39.0
Value addition information	4.7	4.7	1.7
Funding options information	10.9	30.2	15.6
Other information eg.HIV	3.1	2.3	5.1

Chi-square=51.631; Likelihood ratio=30.558; statistically significant at $p \leq 0.05$ ($p=0.004$)

In this study, men preferred mostly marketing information and information on crop husbandry practices while women and youths preferred information on crop husbandry practices. This is contrary to studies by researchers like Lightfoot *et al*. (2008); McNamara (2008); Mwakaje (2010); Sommers (2010) and RIU (2011) that found the majority of community members mostly require information related to price of agricultural produce from communication media.

Furthermore, results from the FGDs and KIIs indicate that men mostly obtained information on improved crop and livestock husbandry practices (on availability of inputs, improved seeds and breed and feeding from communication media in broadcast format (radio and television), women obtained information on land preparation and control on pests and Newcastle and other diseases from booklets.

However, during FGDs and KIIs, participants pointed out that much of information broadcast on the FM and medium frequency radio was entertainment and non-agricultural information and news with little agricultural information. Generally, they said compared to other communication media, radio has not helped them to obtain relevant agricultural information. This finding suggests that though men mostly obtained information on improved crop and livestock husbandry practices from radio, but it is not a suitable medium for disseminating agricultural information in rural communities. This is contrary to the study by Kalusopa (2005) that indicated radio as the major source of agricultural information in rural areas.

Finally, the youth obtained information on improved crop and husbandry practices from mobile phones. For instance, the FGD results at Wami Sokoine village gave evidence on youths' acquisition of crop husbandry information from mobile phone. One youth participant in the FGD who benefitted fromTigo Kilimo SMS especially on maize production said that:

"I enrolled in Tigo Kilimo Short Message Service (SMS) one year ago. Since enrollment in Tigo-Kilimo SMS, I have improved my maize productivity in terms of production (like 15 bags), hence my income has improved as compared to two years back. I get messages on proper planting time, improved maize varieties, suitable soils for maize production, fertilizer application, how to identify and control pests and diseases that is charged 150/= per SMS" (FGD 9, youth participant 1).

Although the use of mobile phones was found to be positive in this study in terms of delivering crop husbandry messages on cereal crops, the study that was conducted by Molony (2006) in Southern Higlands of Tanzania found that farmers in rural communities did not trust the mobile phones because of unreliability of information received via the mobile phones. Additionally, the FGDs results indicate that mobile phones were not useful in delivering agricultural information on horticultural crops. The FGDs participants had a concern that Tigo Kilimo SMS was not responsive to farmers' information need, as only few crops such as maize, paddy, round potatoes, cassava, banana, citrus fruit tree and sweet potatoes were listed in the menu. Hence, this limits farmers' choices and decisions in agricultural production. For instance, one participant during FGD at Ilonga village lamented that:

*"I subscribed to agricultural information through tiGo-Kilimo Short Message Service (SMS) of which I used to dial *148*14# and pay 150/=Tshs. per message. I decided to subscribe to the service on the expectation of receiveing information on high value horticultural crops such as onions, tomatoes, pigeon peas and watermelons but I have not benefitted much on the service. It is not demand driven as high value horticultural crops are left out in the list"* (FGD 2, youth participant 2).

The differences between community members could have been attributed to different agricultural information needs of men, women and youths. The results point a need for understanding charactesristics and agricultural information needs of men, women and youths for targeting properly the information through the communication media. This also has implication for acceptability of communication media by them. For

instance, there is a need to understand that the youth in the rural community are optimistic and risk takers when it comes to agricultural production. They are always eager to advance their households, hence easily adopt new technologies accessed through communication media that is acceptable by them for increased productivity. The study conducted in Kilosa District by Sebigya and Kuzilwa (2010) indicated that on average, younger farmers who adopted the formalised land conservation approaches had higher maize productivity than aged farmers.

Language use on communication media

Results on own assessment through Critical Discourse Analysis (CDA) based on linguistic features of the text (vocabularly, grammar, syntax and sentence coherence); discursive practice (in the way texts are produced and interpreted) and wider social practice (through exploring links between language use and how should the media content be interpreted by that particular community) indicate that the use of simple language in media derives applicability of messages from it. For instance, at Wami Sokoine village participants during FGDs said that:

"We received messages from video on bee keeping. We're very lucky; message presentation from the video on beekeeping was simple. It enabled us to construct improved beehives and harvested honey successfully. In addition, we acquired information on poultry husbandry such as construction of improved poultry housing and marketing through Radio Maria. We were able to construct improved poultry houses and got access to markets for our local chicken" (FGD 9, youth participants).

In addition, with regard to print media, one participant in the same village commented that:

"I received booklets that were distributed free of charge by seed companies, researchers and extension agents that had information on maize production. Language used in some booklets was not clear. English language was used in few leaflets and booklets. It was difficult for me; I could not understand as most of us have low level of education. In addition, most booklets were written in Kiswahili language. However, the scientific language in the booklets was difficult to comprehend otherwise needs proper facilitation from extension officers. For example, planting spacing on the booklet of 75' x 75' and other scientific terms to most famers was difficult to comprehend"(FGD 4, male participant 1).

Additionally, the key informant, village extension agent at Ilonga village said that:

"The adoption process depends on whether the message presentation was simple or complex, costs involved in getting that message, time consumed in getting the message and resources available in farmers' locality to put the message in practice. My long time experience of working with farmers, I always see them failing to apply the message especially on booklets which its presentation is complex and more time is consumed in getting the instructions right" (KII 3, Ilonga village).

In the context of this study, qualitative results above indicate that simplicity in message presentation enabled community members to acquire agricultural information from the communication media. For example, based on the interpretation of social practice in discourse analysis, simplicity of message presentation on video and radio assisted better community members to acquire agricultural information as compared to booklets. This implies that there is direct relationship between language use in terms of its presentation in communication media and applicability of message.

Hence, not any language could have been used in the medium of choice. Therefore, the presentation of complex message such as the use of difficult terms, scientific language in print media may directly influence community members' preferences for messages in the media. By default, this indicates negative influence on community members on their acceptability for print media especially booklets.

Clarity of messages on communication media

Results based on researcher's assessment through CDA of articles such as NA1, NA2 and NA8 (Appendix 10 and 11) indicated that they were used to deliver the messages on how to control striga, how to improve soil fertility, etc. However, articles NA2, NA3, NA6, NA7, and NA8 (Appendix 10 and 11) had information presentation weaknesses in terms of clarity and complicated writing style for readability. For example, article NA3 had the message with crowded words on poor quality paper that was presented in everyday language, Swahili with exception of few English language words Such as "*KATC project phase II"*, "*project concept"*, and *"farmer to farmer extension"* and one Swahili language jargon used, *"Ihana ya mradi"*.

Generally, evidence from the analysed articles based on researcher's assessment has indicated that most of communication media in print format (leaflets and booklets) were not free from errors, poorly coloured, crowded with words and complicated style of writing. The results from FGDs show community members especially women were negatively influenced to accept communication media in print format such as leaflets and booklets. Key informants interviews indicated that the production and distribution of communication media in print format (leaflets and booklets) were not

taken as a professional work and not valued in terms of investment in resources (money and time). They said that funds allocated for the production of communication media in their organisations was always small to produce quality leaflets and booklets. The procedural steps that has to be followed before mass production were by passed, hence this jeopardised the quality of most produced leaflets and booklets. Key informants expressed their concern that the procedural step like pre-testing to assess the usefulness of the print material and as an important step for getting feedback from consumers of the communication media in print format on the quality and clarity is always bypassed due to lack of fund.

In connection with communication media in print format in particular, researchers in the field of communication have suggested procedural steps as guidelines for producing comprehensible, attractive and readable leaflets and booklets. For instance, Leeuwis (2004:194-195) outlines them as follows: firstly, establishment of the purpose of the material ; secondly, identification the target audience; thirdly, deciding on the general types of the materials to be produced; fourth, establishment of the instructional objectives; fifth, decision on the contents, methods and techniques; six, organization of the presentation of the materials to facilitate use and learning; seventh, choice of an attractive format and writing style and eight, pre-testing the prototype materials and assess their usefulness.

4.5.3 The relationship between the content of communication media and their preferences by men, women and youths in rural communities

The results in sub-section 4.5.1 indicate that men preferred agricultural information from radio and television (on availability of inputs, improved seeds and breed and feeding), women preferred information from booklets (land preparation and control on pests and Newcastle and other diseases), and while the youth preferred information from mobile phones (crop husbandry practices). However, results on CDA (based on researcher's assessment) revealed that communication media in print format (leaflets and booklets) were full of errors, poorly coloured and crowded with words and cumbersone style of writing, hence negatively influenced community members on their acceptance and FGDs results indicate that community members especially women liked most video as an alternative to leaflets/booklets as they can both hear and see what is being demonstrated.

According to Media Uses and Gratification Theory, among mass communication and audience analysis theories, different communication media users are influenced differently by different communication media. That means, the preference for communication media is rational as individuals take active roles in choosing the media they prefer to use in satisfying their needs. Therefore, based on different needs for agricultural information from communication media, these needs have influenced men in their preference for communication media in broadcast format (radio and television), women in their preference for booklets, and the youth in their preference for mobile phones. However, based on clarity of agricultural information on the booklets, women preferred video to booklets.

4.6 The Effects of Constraints and Perception on Preferences and Utilisability of Communication Media in Rural Communities

This section discusses two factors which are major constraints and perception in affecting utilization of communication media in rural areas. The section starts by describing the established constraints that referred to "major constraints" that were re-grouped by using SPSS. This study identified organisational constraints, economical and support services constraints, and social and regulatory constraints, as newly added constraints in media studies. The UNESCO study of 1996 identified seven constraints as far as the utilisation of ICTs and communication media is concerned which are technological constraints; financial constraints; political and institutional constraints; content and interface constraints; ethical and legal constraints; human resource constraints; and socio-cultural constraints (UNESCO, 1996). Then, the perception of community members on the presentation style of communication media is also discussed.

4.6.1 Major constraints to effective utilisation, access and preference for communication media in rural communities

Results indicate that three factors referring to "major constraints" on the utilisation communication media in print, broadcast and electronic formats were established and classified as components 1, 2 and 3 (Table 18). The established constraints accounted for 58.5% of variance. The variance suggests that the items were suitable in measuring community members' views.

Table 18: Summary of constraints to utilisation of communication media in rural communities

Components	Loaded Items	Factor Loading (SSL)	Eigenvalues	Percentages (%)of Variance	Cronbach's Alpha (α)
1	1.Lack of essential skills and knowledge in designing and using communication media	0.757	3.032	33.684	0.721
	2.Reliability of agricultural information	0.730			0.70
	3.Unreliable power supply	0.482			0.730
2	1. Distance from community/regional libraries and other accessories (eg. decoders)	0.736	1.203	13.368	0.724
	2.Use of difficult language in communication media	0.670			0.708
	3.Low level of income	0.646			0.704
	4. Reliability of power supply	0.466			0.730
3	1. Myths on associated health risks (eg. poor vision, impotency, brain damage, etc)	0.820	1.026	11.405	0.716
	2.Poor communication policies	0.599			0.740

Extraction method: Principal component analysis

Results in Table 18 indicate that unreliable power supply was an overlapping constraint between organisational constraints, and economic and support services constraints. This result confirms that most of the selected study villages in Mvomero and Kilosa Districts were characterised by isolation and poor infrastructures as per the definition of rural areas by International Telecommunications Union (ITU) (2000). This caused unreliable power supply in terms of electricity power rationing, sometimes mul-fuctioning or counterfeit solar panels/batteries which constrain rural community members in these districts in their utilisation for television and communication media in electronic format (internet, video and mobile phones). The results support the qualitative results in sub-section 4.3.2 on how the availability of television in rural areas is affected by the lack of sutainable power supply. This implies that the efforts to increase benefits from television and internet for communicating agricultural information should be linked with efforts to improve the availability of power sources in rural communities.

Organisational constraints

Results in Table 18 indicate that the first component includes all constraints that could be grouped under the label "organisational constraints". This group consists a proportion of 33.68 % out of 58.46 % of the explained variance. Results, thus indicate that community members in rural areas are constrained by lack of essential skills and knowledge in designing and using communication media (SSL=0.757), reliability of agricultural information (SSL=0.730), and unreliable power supply (SSL=0.482) on utilising certain communication media. Analysis of the three items making the organisational constraints indicates that lack of essential skills and knowledge in

designing and using communication media was the most serious constraint among community members in utilising certain media with statistically significant loading (SSL) greater than 0.70 (SSL=0.757).

Basing on factor loading these results imply that the lack of essential skills and knowledge in communication media design and use was to a large extent the most inhibiting constraint in community members' utilisation for communication media. These results corroborate with those of Irmer and Bordia (2003); Caspi and Gorsky (2005); Dabaj (2005); Adebayo and Adesope (2007) who found that the lack of appropiate skills and knowlege affects a person in communication media use, consequently affect his/her choice of a certain media.

The results in the present study suggest that, lack of essential skills and knowledge as far as design and usability of communication media is concerned was both a constraint for the utilisation of appropriate information and a trigger of problems related for reliability of agricultural information from the media. The lack of appropriate skills and knowledge on designing communication media appear to be rooted in the failure of the organisations in the provision of relevant skills that consequently has effect on the quality of communication media and its utilization and preference at grassroots. For instance, it is clearly pointed out by Irmer and Bordia (2003) that the provision of appropriate skills and knowledge to professionals determine organisational success in improving communication media usability as well as providing contexts for reliability of information from such media.

This means that, staff re-tooling on communication media design and use, and follow up mechanisms at grassroots would afford staff opportunities for interactions with people and tools that could have large influence to people on their utilisation of certain communication media in print, broadcast or electronic formats. For instance, a study by Matovelo (2008) indicated that low literacy level among rural people was a barrier in print media use. Hence, there is need for information providers to make follow ups and understand whether the print media disseminated to rural communities are being used or not. Should there be a problem of low literacy what kind of alternative medium can be used? However, evidence below indicates that professionals did not make any follow ups on the usability of communication media by community members. A key informant, the researcher at SUA revealed that:

"I used to disseminate agricultural information to the target group through communication media like leaflets, booklets, video and television eg. SUA TV.However, I don't make any follow ups to the target group to see whether the message within the communication media was understood as intended in agricultural production or not" (KII 5, SUA, Morogoro).

Therefore, the results generally imply that, the effort to increase the utilization and preference of communication media in print, broadcast or electronic formats for communicating agricultural information in the rural communities should be linked with efforts to change the organisational culture and planning on follow ups to assess the usability of communication media by men, women and youths in rural communities. In addition, this is to equip staff with andragogy methodology on how to deliver quality messages to clients through communication media in relation to their social environment.

Economical and support services constraints

The second component includes all constraints that could be labelled "economical and support services constraints". The group together constitutes about 13.37 percent out of explained 58.46 percent variance. Under this category the constraints which can influence community members' decision to use or refrain from using certain communication media included distance from community/regional libraries and other accessories (e.g. mobile phone charge vouchers, electronic equipment spare parts, decoders, etc.) (SSL=0.736), use of difficult language in communication media (SSL=0.670), low level of income (SSL=0.646) and reliability of power sources (SSL=0.466).

This study has indicated that distance from community or regional libraries and other accessories was, to a large extent, the most inhibiting constraint as compared to other constraints such as the use of difficult language in communication media, low level of income and reliability of power sources. This is contrary to knowledge gap studies, like Severin and Tankard (2001) who were of the view that the major factor that inhibits communication and media utilisation were the cost of searching for information from media.

These results imply that the accessibility of the village in terms of conditions of the road determined its connectivity to external worlds (e.g. accessibility of communication media, accessories etc.). In this study, qualitative results from FGDs and KII largely revealed that most of communication media on agricultural production were not readily available in the study areas and respondents especially

men and youths said that they had to travel long distances to search for communication media like video and accessories, like electronic equipment spare parts, etc. This constraint could negatively influence women in the rural community in their utilisation and preference for communication media like video tapes/DVDs. This is due to the fact that women did not have time to travel in search of communication media for acquiring agricultural information as they were burdened with child care duties.

The results suggest that there is a need for timely access to appropriate information at community members' proximity. Thus, there is a need to device a mechanism for equal access of agricultural information from various communication media in print, broadcast and electronic formats and their related accessories by men, women and youths in rural areas.

Social and regulatory constraints

The third component was labeled as "social and regulatory constraints". In this category consists of two constraints that included myths about associated health risks (e.g. poor vision, impotency, brain damage, etc.) (SSL=0.820), and poor communication policies (SSL=0.599). However, constraints under this component had less influence as far as the utilisation of communication media is concerned, since other constraints were to be added in the measuring instrument so as to raise the explained variance above 11.41%. These results deviate from UNESCO's (1996) study that recognised communication policies as part of political and institutional constraints. Unreliable power supply constraint was also re-categorised as part of technological constraints.

The myth that various communication media had health risks (e.g. poor vision, impotency, brain damage, etc.) loaded significantly as most inhibiting constraint for community members' utilisation of television, video, radio and leaflets. Therefore, this was, to a large extent, the most inhibiting constraint as far as social and regulatory constraints are concerned. Qualitative results confirm the myth that various communication media had health risks. For instance, one FGD participant at Magole village who used to keep cell phone in his trousers claimed a longtime experience of nerve problems in his legs. In addition, poor signals affected the visibility of most television screens. This has led to little utilisation of this medium in the study area. During FGD at Ilonga village (Kilosa District) one respondent said that:

"I started watching television two years ago, and later experienced eye problems. I currently, use a pair of spectacles" (FGD 10, male participant 1).

Evidence from the FGDs indicates that claim on side effects associated with television, radio and mobile phones use such as eye defect and nerve problems could constrain community members' in their utilisation for television, video, radio and leaflets. However, there was no scientific evidence of whether those problems related to eye defect and nerve problems were the result of television, radio and mobile phones use or other causes. There is therefore a need for further research on the matter.

4.6.2 The influence of perception on utilisation and preference for communication media in rural communities

Results in Table 19 indicated the respondents' responses on their perception on presentation style of information on communication media. About 35.8% of

respondents strongly agreed on the statement that communication media that present information with combination of good pictures and voice (voice and pictorial presentation) motivated to utilise such communication media, while 95.7% of respondents strongly disagreed to utilise communication media in print format that present information in terms of black text without decorations on papers.

Table 19: Respondents' perception with regard to the style of information presentation on utilization of communication media

Statements on respondents perception on how the style of information presentation influences their perception on utilization of communication media	Percentage of respondents' responses on their level of agreement (n=240)				
	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
Community members positively perceive the presentation of agricultural information in form of good pictures (still/moving) and voice on the communication medium as this kind of combination influences them to utilize such medium	35.8	0	4.2	35	25
The most positively perceived utilised communication medium is the one that presents agricultural information in form of different coloured pictures and text	0	18.2	16.8	37.5	27.5
Community members positively perceive that any communication medium that presents agricultural information in form of cartoon becomes mostly utilised	0	10.2	13.9	52.1	23.8
Most of community members positively perceive that the presentation of agricultural information in form of drama (textual drama and audio visual drama) on communication medium derive their satisfaction on utilization of such medium	10.4	24.9	0	64.7	0
Presentation of agricultural information using black text on white papers without decorations impacts community members' mental faculty negatively, hence this affects the utilizability such print media in the rural community	0	4.3%	0	0	95.7

The results on strongly disagree imply that the way information is presented on communication media in print format influences community members negatively in their utilization and preference for this format, while the presentation of information on communication media with good still or moving pictures combined with voice influences community members positively in their utilization and preference for that media. During FGDs respondents said that the combination of good still or moving pictures and voice on media of their preference enhanced their understanding, in terms of simplifying complex information. In addition, the communication media that present information with the combination of good still or moving pictures and voice left positive memories in their mental faculties. The result corroborate with that by Schär and Kruger (2014) who found that presentations of animation or pictures combined with voice had a positive effect on knowledge acquisition.

The results suggest that men, women and youths in rural communities prefer to utilise most video, television and internet than print media as they can offer combination of good pictures and voice to satisfy their needs of information acquisition. However, in the present study, FGDs results indicated that it was only three villages (Nyandira, Wami Sokoine and Ilonga villages) that reported to have seen video in their localities. This means, video is not accessible to more than 50% of the study villages. Furthermore, unreliable power supply as reported in section 4.6.1 impinges the utilisation of video, television and internet in the study area.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

This chapter provides conclusions through pointing out the broad implications of the findings. It highlights areas that need attention for providers and consumers of agricultural information through communication media in the rural community. The chapter also presents the key recommendations.

5.2 Conclusions

(i) Availability of communication media in rural communities

There is variation in terms of availability of communication media in rural communities. The most common communication media in Mvomero and Kilosa Districts are radio followed by mobile telephones. However, communication media such as television, electronic media (video tapes/DVDs and internet) and print media (leaflets and booklets) are not easily available in rural communities.

The availability of communication media of electronic format, print media format and television for acquisition of agricultural information in most cases is limited by some factors. The availability of television and communication media in electronic format (video tapes/DVDs, mobile phones and internet) is constrained by the lack of electric power, while lack of farmers' resource centers inhibits the availability of video and communication media in print format (leaflets and booklets) in rural communities.

This study concludes that the availability of radio influences men, women and youths in their preference for this medium in the study area, while the lack of income limits

women in their preference for mobile phones due to associated costs of its use. This is a challenge to development organisations that should be addressed to enhance preference for mobile phones in the district.

(ii) Accessibility of communication media in rural communities

Radio is the most accessible communication medium in rural communities due to its independence of electricity, portability and its multiple uses especially for information and entertainment. In this way, it is expected that if a certain radio station is heard in the location, it is likely that men, women and youths would get access to that station.

This study incorporates the positive influence of socio-economic factors such as level of education in preference for leaflets and income in the preference for television in the preference theory. The preference theory shows that there is likelihood for rural community members to prefer leaflets and television over radio for acquisition of agricultural information as their education and income levels increase.

The implication is that as the education level of a community member increases his/her proactiveness increases in information search from leaflets over radio, hence preference for it. In addition, if the community member has higher income, he/she is more likely to prefer television over radio as the amount of income the community member has would enable him/her to incur costs related to television and its operation.

(iii) Contribution of media content in the acceptability of communication media

In the study area, commucation media in print format (leaflets and booklets) are fairly difficult as could not be understood by community members with ordinary level education or diploma training. This is due to longer sentences (average of 24 words per sentence) and words (average of 9 syllables per word) and lack of pretesting.

More seriously, the quality of communication media determines the acceptability of packages of agricultural information on the communication medium in the study area. This quality is largely determined by the content of the communication media that is influenced by factors such as type of agricultural information; type of language used and clarity of messages on communication medium. In addition, there is limited time and financial resources that is set aside within organizations for communication media design and production. Hence, affects the quality and attractiveness of communication media and consequently influence their acceptability by rural communities. This implies investing in resources such as time and money during media design so as to improve the quality of communication media based on media consumers' tastes and interests.

This study concludes that media content influences men, women and youths differently in their preference for print, broadcast and electronic formats of communication media in rural communities. Based on the content that meets their information needs, men prefer broadcast format (radio and television), women prefer booklets, while youths prefer mobile phones in the acquisition of agricultural information in the study area.

(iv) Utilisation of communication media in rural communities

Access, utilisation and preferences for communication media in rural communities is largely inhibited by organisational constraints, economical and support services constraints, and social and regulatory constraints. However, organizational constraints in terms of availability of relevant skills to professionals on media design and use and assurance of energy power have potential in influencing the acceptability and successful utilization of communication media in broadcast and electronic formats by various groups in rural communities. This poses a challenge to the public and private sectors to ensure the availability of relevant skills on media design and reliable power supply to ensure accessibility of agricultural information through communication media in rural communities.

Again, the importance of perception in influencing the utilisation and preferences for communication media in rural communities is of relevancy. When the agricultural information is presented in form of good pictures (still/moving) and voice on the communication medium, it positively influences men, women and youths in their preference for such medium in rural communities. This has implication for men, women and youths in rural communities to prefer utilising mostly video, television and internet compared to print media as they can offer combination of good pictures and voice to satisfy their needs of information acquisition.

(v) Contribution to the theory and body of knowledge

This research has shown the importance of preference theory as theoretical lens in establishing the preferences for communication media of different formats (print,

broadcast and electronic) among men, women and youths in rural communities. In addition, this study highlights the contribution to the body of knowledge in agricultural communication as far as available literature is concerned. For example, in information science (discourse research), it established the Flesch index of 54.99 (never established before) for readability (leaflets and booklets) in the study area and in media studies, it classified new constraints on media use through factor analysis. These include organisational constraints as the most important constraints to utilisation and preferences for communication media followed by economical and support services constraints and social and regulatory constraints in rural communities.

5.3 Recommendations

Based on the major conclusions, the following recommendations are made:

1. **Increase the number of farmers' resource centres to enhance the availability of communication media in the study area.**

The study recommends that the Ministry of Agriculture, Livestock and Fisheries in collaboration with District Councils should increase number of farmers' resource centres at least in every ward to enhance the availability of communication media in the study area. These centres should also be equipped with timely, relevant, appropiate and adequate booklets, leaflets, video tapes/DVDs covering agricultural information on various topics.

2. **Enhancing accessibility of agricultural information through radio in rural areas in Mvomero and Kilosa Districts.**

Researchers from Agricultural Research and Development (R&D) institutes, and other information providers should focus on radio as the most accessible medium in rural areas in disseminating agricultural information in Kilosa and Mvomero Districts. This will increase farmers' awareness on available technologies for increased productivity in remote rural communities in Mvomero and Kilosa Districts.

3. **The government's intervention on reduction of television and cellphones costs and associated running costs to boost their usage and accessibility to poor people.**

This study recommends the Government's intervention on cost reduction of television sets and cellphones. In addition, the reduction of mobile phone airtime cots, subscription fees for pre-paid satellite decoders and electric charges. This will boost the usage and accessibility of televisions and mobile phones to low income community members for acquisition of agricultural information in the study area.

4. **Increase funds to improve attractiveness and readability of print media within the organisations to enhance their acceptability in rural areas.**

This study recommends agricultural information providers to set adequate funds for print media production. The fund will enable production of leaflets and booklets on quality and attractive papers. In addition, observing the procedural steps on print media production to achieve desired sentence and word length for readability and attractiveness of the media to suit men, women and youths in rural areas.

Futhermore, the available fund would enable pre-testing exercise before mass production to achieve the Flesch index of at least 60 to 70 per leaflet/booklet. This index will ensure the achievement of an average sentence length with number of words per sentence per leaflet/booklet of 13 words and average word length of 4 syllables per word for easy readability of leaflets and booklets to people with low level of education in Mvomero and Kilosa Districts.

5. Improving the availability of electricity in Mvomero and Kilosa Districts to increase utilisation of television, internet, video and mobile phones.

The government through Tanzania National Electricity Supply Company (TANESCO) should increase number of villages under the rural electrification programme to ensure sustainable supply of power in rural areas. In addition, it should mobilise companies to invest on renewable power so as to ensure the availability of electricity in rural areas such as provision of durable solar power panels and wind power panels. This will enhance the accessibility and utilisation of electronic media (internet, video tapes/DVDs and mobile phones) and television in rural area in Mvomero and Kilosa Districts.

6. Further areas of research:

The study recommends further studies in the following areas:

(i) In examining the readability of communication media in print format, this study was limited to few leaflets and booklets with agricultural information in the study area. It is therefore suggested that further research be carried out on examining the readability of different communication media of print format (leaflets, booklets and

newspapers) with diversities in information presentation through increasing sample size of articles and study coverage in Tanzania in order to have a better basis for generalization of research results. In addition, issues pertaining to media credibility and preferences for communication media in print, broadcast and electronic formats versus traditional media (face-to-face) among men, women and youths or among ethnic groups (race) for acquisition of agricultural information should be captured in future studies.

(ii) This study treated youths as homogenous group as their interests and needs in literature did not seem to differ in previous studies. No attempt was made in this study to assess differential preferences for communication media of different formats on acquisition of agricultural information by male and female youths with different socio-economic characteristics. It is therefore suggested that future research should assess preferences for communication media of different formats between male and female youths with different socio-economic characteristics.

REFERENCES

Adebayo, E.L. and Adesope, O.M. (2007). Awareness, access and usage of information and communication technologies between female researchers and extensionsists. *Journal of Education and Development Using Information and Communication Technology* 3(1):85-93. [http://ijedict. dec.uwi.edu/viewarticle.php?id=282&layout=html] site visited on 13/5/2013.

Adomi, E.E.,Ogbomo, M.O. and Inoni, O.E. (2003). Gender factor in crop farmers' access to agricultural information in rural areas of Delta Stae, Nigeria. *Library Reviews* 52: 388-393. [http://www.emeraldinsight. com/doi/ pdfplus/10.1108/00242530310493798] site visited on 13/1/2011.

Ajayi, M.T. and Solomon, O. (2010). Influence of extension contact and farmers' socio-economic characteristics on adoption of oil palm technologies in Aniocha north local government, Delta state, Nigeria. *Journal of Agriculture Science and Technology* 12: 35-46.

Akrofi, A. (2006). Ghanaian cocoa farmer video tackle pod pest. *ICT Up-to-date* 34, 10.

Araka, J.M. (2008). Ineffective working groups' communication as groupthink outcome: The effects of cohesiveness. *African Communication Research Journal* 1: 235-239.

Babbie, E. (2007). *The Practice of Social Research Method* , 11th edition. Cengage Learning Inc.,U.S.A.583pp.

Bagnall-Oakeley, H., Ocilaje, M.,Oumo, F., Nangoti, N., Oruko, L. and Rees, D. (2004). Mapping and understanding farmers' indigenous agricultural knowledge and information systems and the implications for contracted research and extension. *Uganda Journal of Agricultural Science* 9: 119-125.[http://www.ajol.info/index.php/ujas/article/view/134524/124134] site visited on 23/2/2011.

Bailey, K.D. (1994). *Methods of Social Research*. Free Press, New York.345pp.

Bentley, J.W., Boa, E., Van Mele, P., Almanza, J., Vasquez, D. and Eguino, S. (2003). Going public: A new extension method. *Agricultural Sustainability* 1 (2), 108-122. [http://www.tandfonline.com/ doi/abs/ 10.3763/ijas.2003.0111] site visited on 23/2/2011.

Bertolini, R. (2004). Making information and communication technologies work for food security in Africa. International Food Policy Research Institute (IFPRI) 2020 African Brief 11.pp.1-6.

Bless, C., Higson-Smith, C. and Kagee, A. (2006). *Fundamentals of Social Research Methods: An African Perspective*, 4th edition. Juta and Co.,Cape Town.186pp.

Black, K. (1989).Audience analysis and persuasive writing at the college level. *Research in Teaching English*, 23 (3): 231-253 [www.jstor.org/stable/pdf/40171145:pdf?=147005701102] site visited on 01/08/2016.

Boynton, P.M. (2005). *The Research Companion: A Practical Guide for the Social and Health Sciences*. Psychology Press, USA and Canada.208pp.

Branston, G. and Stafford, R. (2006). *The Media Student's Book*. Routledge, USA.576pp.

Bryman, A. (2012). *Social Research Methods*. Oxford University Press Inc., New York.808pp.

Bucheyeki, T.L., Shennkalwa, E., Kadadi, D. and Lobulu, J. (2011). Assessment of rice production constraints and farmers' preferences in Nzega and Igunga Districts. *Journal of Advances in Development Research* 2(1), 30-37.

Commission for Africa Report (CAR). (2010). Still Our Common Interest. London, UK. 68pp.

Carey, H.A. (1999). Communication in extension: A teaching and learning guide.FAO, Rome.144pp.

Carpentier, N., Lie, R. and Servaes, J. (2002). Making community media work. In *Approaches to Development*. (*Edited by Servaes, J.)*. UNESCO, Paris.pp. 1-32.

Caspi, A. and Gorsky, P. (2005). Instructional media choice: Factors affecting the preferences of distance education coordinators. *Journal of Educational Multimedia and Hypermedia* 14(2), 169-198. [http: //www.openu.ac.il/ personal_sites/download/avnercaspi/caspi_gorskyJEMH.pdf] site visited on 20/2/2011.

Chai, S. (2004). *Choosing an Identity: A General Model of Preference and Belief Formation*. Michigan University Press, USA.349pp.

Chapman, R. and Tripp, R. (2003). Changing incentives for agricultural extension: A review of privatized extension in practice. Agricultural Research and Extension Network. Network Paper No.132. 11pp.

Chigona, W. and Mooketsi, B. (2011). In the eyes of the media: Discourse of an ICT4D project in a developing country. *The Electronic Journal on Information Systems in Developing Countries* 46: 1-16. [http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/636/356] site visited on 10/2/2011.

Chilimo, W.L. (2008). Information and communication technologies and sustainable livelihoods: A case of selected rural areas of Tanzania. Thesis for Award of PhD Degree at University of KwaZulu-Natal, Pietermaritzburg, South Africa, 404 pp.

Chilimo, W.L., Ngulube, P. and Stilwell, C. (2011). Information seeking patterns and telecentre operations: A case of selected rural communities in Tanzania. *Libri* 61: 37-49. [http://researchspace.ukzn.ac.za /xmlui/ bitstream/ handle/10413/10695/stilwell_christin 2011..pdf?sequence=1] site visited on 20/7/2011.

Chowdhury, S.K. and Wolf, S. (2003). Use of ICTs and economic performance of small and medium enterprises in East Africa.Discussion paper no.2003/06.18pp.

Christoplos, I. and Nitsch, U. (1996). *Pluralism and the Extension Agent: Changing Concepts and Approaches in Rural Extension*.Swedish University of Agricultural Sciences, Sweden.62pp.

Creswell, J.W. (2007). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Sage Publications, London.414pp.

Dabaj, F. (2011). Analysis of communication barriers to distance education: A review study. *Journal of Communication and Media Technologies* 1: 1-15. [http://ojcmt.net/articles/11/111.pdf] site visited on 18/9/2011.

Daku, L., Norton, G.W., Taylor, D.B., Qenami-Petrela, E. (2005). Agricultural extension in South-Eastern Europe: Issues of transition and sustainability. *International Journal on Changes in Agricultural Knowledge and Action System* 11: 46-50.

Defleur, M. L. (1998). Where have all the milestones gone? The decline of significant research on the process and effects of mass communication.*Mass Communication and Society* 1:85-98.[http://dx.doi.org/ 10.1080/ 15205436.1998.9677848] site visited on 23/2/2014.

Dragon, A.G. (2003). Vertical minds versus horizontal culture: An overview of participatory processes and experiences. In *Approaches to Development*. *(Edited by White, S.A.)*. UNESCO, Paris. pp.17-18.

Elly, T. and Silayo, E.E. (2013). Agricultural information needs and sources of information of the rural farmers in Tanzania. *Library Reviews* 62(8/9), 547-566. [http://www.emeraldinsight.com/doi/pdfplus/10.1108/LR-01-2013-0009] site visited on 23/02/2014.

FAO. (2002) Methodological Guide for Designing and Implementing a Multimedia Communication Strategy. A Bilingual Regional Workshop on Methodologies for Designing and Implementing Multimedia Communication Strategies and National Communication Policies, Niamey, Niger, 1-5 April, 2002. 44pp.

Fawole, O.P. (2006). Poultry famers' utilization of information in Lagelu Local Government Area, Oyo State of Nigeria. *International Journal of Poultry Science* 5(5), 499-501. [www.pjbs.org/ijps/fin542.pdf] site visited on 23/11/2011.

Fawole, O.P. (2008). Pineapples farmers' information sources and usage in Nigeria. *Bulgarian Journal of Agricultural Science* 14: 382-388. [www.agrojournal.org/14/04-05-08.pdf] site visited on 23/11/2011.

Field, A. (2009). *Discovering Statistics Using SPSS*, 3rd edition. SAGE Publications Ltd., London, U.K.857pp.

Flesch, R. (1948).A new readability yardstick. *Journal of Applied Pyschology* 32(3):221-233. [http://psycnet.apa.org/ ?&fa=main.doiLanding &doi =10.1037/h0057532] site visited on 13/11/2014.

Foot, K. (2014). The online emergence of pushback on social media in the United States: A historical discourse analysis. *International Journal of Communication* 8: 1313–1342. [ijoc.org/index.php/ ijoc/article/viewFile /2376/1137] site visited on 2/10/2015.

Forje, J.W.(2006).Constructing a developing nation: The challenges of science, technology and innovation in the socio-economic transformation of Africa. *Perspectives on Global Development and Technologies* 5 (4):367-384.

Foth, M. and Hearn, G. (2007). Networked individualism of urban residents: Discovering the communicative ecology in inner-city apartment buildings. *Information, Communication and Society* 10: 749-772. [http://www.tandfonline.com/doi/abs/10.1080/13691180701658095] site visited on 23/11/2011.

Fraser, C. and Villet, J. (2000). Communication a key to human development. Development Support Communication Branch of Information Division of FAO, Rome.36pp.

Gakuru, M.,Winters, K. and Stepman, F.(2009). Inventory of innovative farmer advisory services using ICTs: The Forum for Agricultural Research in Africa (FARA). W3C Workshop "Africa Perspective on the Role of Mobile Technologies in Fostering Social Development" April 1-2, 2009, Maputo, Mozambique.pp.1-13

Garramone, G. and Atkin, C. (1986). Mass communication and political socialization: specifying the effects. *American Association for Public Opinion* 50: 76-86. [http://poq.oxfordjournals.org/content/50/1/76.full.pdf+html] site visited on 08/08/2013.

Garver, M. S. and Mentzer, J.T. (1999). Logistics research methods: Employing structural equation modeling to test for construct validity. *Journal of Business Logistics* 20 (1):33-57.

Gray, D.E. (2004). *Doing Research in the Real World* .SAGE Publications,London. U.K.441pp.

Greene, W.H. (2003). *Econometric Analysis*, 5th edition.Pearson Education Inc., Upper Saddle River, New Jersey.959pp.

Habermas, J. (1984). *Reason and Rationalisation of Society*.Beacon Press, Boston.562pp.

Hafkin, N. (2003). The African information technology: 1995-2000. In *Science and Technology in Africa*. *(Edited by Kakoma, I. and Zeleza, P.T.)*. Africa World Press Inc, USA and Eritrea.pp.95-126.

Hesse-Biber, S.N. (2010). *Mixed Methods Research: Merging Theory with Practice*.The Guilford Press, New York, U.S.A. 242pp.

Heyzer, N. (2005). Perspective on gender issues and the digital divide. In: *African CSOs Speak on the World Summit on the Information Society*. Economic Commission for Africa.pp.17.

Hill, R.C., Griffiths, W.E. and Lim, G.U. (2008). *Principles of Econometrics*, 3rd edition. John Wiley and Sons, Inc., USA. 579pp.

Howley, K. (2005). *Community Media: People, Places and Communication Technologies*. Cambridge University Press, London, U.K.324pp.

Hudson, H. E. (2006). *From Rural Village to Global Village:Telecommunications for Development in the Information Age*. Lawrence Erlbaum, Danbury.170pp.

Irmer, B. and Bordia, P. (2003). Multiple determinants of media choice: The role of symbolic cues and contextual constraints. *International Journal on E-Learning* 2: 51-58 [http://www.learntechlib.org/p/14498] site visited on 25/11/2011.

International Telecommunication Union (ITU) (May, 2000). New technologies for rural application: final report of ITU-D focus group 7. [http://www.silocal. org/datos/si/04/07 .%20New%20 Techn%20for%20rural%20appl.pdf] site visited on 10 /5/ 2011.

Iwe, J. I. (2005). Globalization of information and the Nigerian librarian. *International Federation of Library Associations and Institutions (IFLA) Journal* 31-342. [http://ifl.sagepub.com/content/31/4/342] site visited on 23/11/2011.

Jensen, R. (2009). Information,efficiency and welfare in agricultural markets: Agricultural economics. Paper presented at the 27th International Association of Agricultural Economists Conference.16-22 August, 2009, Beijing, and China.pp 1-29. [http:// ageconsearch.umn.edu/ bitstream/ 53206/2/ICTs_Agriculture_Jensen.pdf] site visited on 14/03/2011.

Johansson, L., Haglund, Å., Berglund, L., Lea, P. and Risvik, E. (1999). Preference for tomatoes, affected by sensory attributes and information about growth conditions. *Preference* 1: 289–298. [www. sciencedirect. com/science / article/ pii/S0950329399000221] site visited on 23/06/2014.

Juanwen, Y. and Niehof, A. (2011). Agricultural Technology Extension and Adoption in China: A Case from Kaizuro Township, Guizhou Province. *The China Quartely* 206: 412-425. http://journals.cambridge. org/action / displayFulltext?type=1&fid=8309556&jid=CQY&volume] site visited on 08/11/2012.

Jupp, V. (2006). *The SAGE Dictionary of Social Research Methods*. Thousand Oaks-SAGE Publications, California, USA.348pp.

JΦrgensen, M. and Phillips, L. (2002). *Discourse Analysis as Theory and Method*. SAGE Publication Ltd., London, U.K.229pp.

Kadago, B.I. (2009). The role of television in promoting agricultural expertise: A case study of SUA-TV local chicken husbandry in Morogoro Municipality. Dissertation for Award of MA Degree at St.Augustine University, Mwanza, Tanzania, pp.198-290.

Kalusopa, T. (2005). The challenges of utilizing Information Communication Technologies (ICTs) for the small-scale farmers in Zambia. *Library High Tech* 23(3), 414-424. [http://www.ubrisa.ub. bw/handle /10311/ 764? Show =full] site visited on 23/11/2011.

Karpf, A. (1988). *Doctoring the Media:Reporting of Health and Medicine*. Routledge, London, U.K.288pp.

Karshenas, M. (2001). Agriculture and economic development in sub-Saharan Africa and Asia. *Cambridge Journal of Economics* 25: 315-342.

Katz, E., Blumler, J.B. and Gurevitch, M. (1974). Utilisation of Mass Communication by the Individual. In *The Uses of Mass Communications:Current Perspectives on Gratifications Research*. *(Edited by E.Katz, E. and Blumler, J.B.)*. Beverly Hills,Sage California. pp.19-32.

King, R.C. and Xia, W.D. (1997). Media appropriateness: Effects of experience on communication media choice. *Decision Sciences* 28: 877-910. [http://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.1997 .tb01335 x/epdf] site visited on 16/02/2011.

Kombo, D.K. and Tromp, D.L.A. (2006). *Proposal and Thesis Writing: An Introduction*. Pailine Publications Africa, Nairobi.168pp.

Krippendorff, K. (2013). *Content Analysis: An Introduction to its Methodology*, 3rd edition. SAGE Publication Inc., New York. 456 pp.

Krzanowski, W.J. (2007). *Statistical Principles and Techniques in Scientific and Social Investigations*. Oxford University Press, New York, USA.300pp.

Lee, K. (2007). Community and inclusion: The impact of new communications technologies. *Irish Journal of Sociology* 16: 77-96

Leeuwis, C. (2004). *Communication for Rural Innovation: Rethinking Agricultural Extension.* Blackwell Science, London.412pp.

Lightfoot, C., Gillman, H., Scheuermeier, U. and Nyimbo, V. (2008). The first mile project in Tanzania: Linking smallholder farmers to markets using modern communication Technology . *Mountain Research and Development* 28: 13–17. [http://www. bioone.org /doi/full /10.1659 /mrd.0970?prevSearch=&] site visited on 12/08/2014.

Lwoga, E.T. (2010). Bridging the knowledge and information divide: The case of selected tele-centers and rural radio in Tanzania. *The Electronic Journal on Information Systems in Developing Countries* 43 (6): 1-14. [http:// www. ejisdc.org/ojs2/index.php/ejisdc/article/viewFile/729/334] site visited on 26/11/2011.

Lwoga, E.T. (2011). Knowledge management approaches in managing agricultural indigenous and exogenous knowledge in Tanzania. *Journal of Documentation* 67 (3): 407-430. [http:// www.emeraldinsight. com/ doi/pdfplus/10.1108/00220411111124523] site visited on 26/03/2012.

Lwoga, E.T., Stilwell, C., and Ngulube, P. (2011). Access and use of agricultural information and knowledge in Tanzania. *Library Reviews* 60 (5), 383-395. [http:/ /www .emeraldinsight. com/doi/full /10.1108 /0024253 1 11 1135263] site visited on 26/03/2012.

Mack, N.,Woodsong,C., Macqueen, KM., Guset,G. and Namey, E. (2005). *Qualitative Research Methods: A Data Collector's Field Guide*. Family Health International, USA.136pp.

March, M., Smyth, I. and Mukhopadhyay, M. (2005). *A Guide to Gender-analysis Framework*. Oxfam GB, Oxford, U.K.144pp.

Markus, M.L. (1987). Towards a "critical mass theory" of interactive media universal access, interdepence and diffusion. *Communivation Research* 14: 491-511. [http://crx.sagepub.com/content/14/5/491.full.pdf+html] site visited on 26/05/2011.

Matambalya, F.A.S.T and Wolf, S. (2006). Does the use of ICT improve the productivity of SMEs in East Africa? The Case of Kenya and Tanzania. In *Information and Communication Technologies for Development and Poverty Reduction*. *(Edited by Torero, M. and Braun, J.V.)*. John Hopkins University Press, Baltimore. pp. 184-197.

Matovelo, D.S. (2008). Enhancing farmers' access to and use of agricultural information for empowerment and improved livelihoods. Thesis for Award of PhD Degree at University of Dar es Salaam, Dar es Salaam, Tanzania, 342pp.

Matovelo, D.S., Msuya, J. and de Smet, E. (2006). Towards developing proactive information acquisition practices among smallholder farmers for empowerment and poverty reduction: A situation analysis. *Quarterly Bulletin of the International Association of Agricultural Information Specialists* 51 (3-4), 256-264.

Mattee, A.Z., Ngetti, M.S. and Rwambali, E.G. (2008). An assessment of the performance of agricultural extension services delivery under ASDP: A Case study of Kilosa and Kilombero Districts. Sokoine University of Agriculture. A Final Report Submitted to Embassy of Ireland, Dar es Salaam.17pp.

Mbwaga, A.M., (May 2005). On-farm verification and promotion of green manure for enhancing upland rice productivity on striga infested fields in Tanzania. [http:// www. researchintouse. com/nrk/ RIUinfo/ outputs/ R8194_FTR.pdf] site visited on 20/08/2011.

Mccombs, M. (2004). *Setting the Agenda: The Mass Media and Public Opinion*. Blackwell Publishing Inc., London.142pp.

McNamara, K. (2008). Enhancing the livelihoods of the rural poor through ICT: A knowledge map. Tanzania country study. Economic and Social Research Foundation (ESRF). Working Paper no. 14.38pp.[http:// www.infodev. org/en/Publication.517.html] site visited on 26/09/2014.

Meerten, H.C.C. and Rölling, N.G. (2000). Non adoption of rice fertilizer technology based on farming systems research extension methodology in Sukumaland, Tanzania: A search for reasons. *Journal of Extension Systems* 16 (2): 1-22.

Meyer, H.W. and Boon, J.A. (2003). Provision of agricultural information and for development: A case study on crossing communication boundaries. *Libri* 53: 174-178.[www. degruyter. com/view/j/libr.2003.53.issue 3/libr. 2003. 174/libr.2003.174.xml] site visited on 03/2/2011.

Mgumia, A.H. (2001). Tanzania- communicating local farming knowledge. *Indigenous Knowledge Notes* 34:1-4.

Mishra, R.C. (2003). *Information Warfare and Cyber Security*.Authorspress, New Delhi. 226pp.

Mitchell, D., Bakardjieva, M.,Adria, P., Pratt, Y.P. (2006). The Construction role of researchers in the social shaping of technology. In: Proceedings of the Community informatics research network conference, "constructions and Sharing Memory". Prato, Italy, October 9-11, 2006.1-32pp. [http://ccnr.infotech.monash.edu/conferences-workshops/prato2006.html] site visited on 03/02/2011.

Moemeka, A.A. (2000). *Development Communication in Action*. University Press of American Inc., Maryland. 336 pp.

Molony, T. (2006). "I don't trust the phone; it always lies:Trust and information and communication technologies in Tanzanian micro and small enterprises". *Information Technologies and International Development* 3: 67-83.

Molony, T. (2009). Trading places in Tanzania: Mobility and marginalization at time of travel-saving technologies. In *Mobile phones: The New Talking Drums of Everyday Africa. (Edited by De Bruijn, M., Nyamnjoh, F. and Brinkman, I.)*. Langaa Research and Publishing CIG, Cameroon and The Netherlands. pp. 92-110.

Moores, S. (2000). *Media and Everyday Life in Modern Society*. Edinburgh University Press, UK. 150 pp.

Morley, D. (1993).Active audience theory: Pendulums and pitfalls. *Journal of Communication*, 43:13-19. [www. onli nelibr ary.wile y.com/ doi/10. 111 1/j.1460-1993.tb01299.x/] site visited on 01/08/2016

Mpehongwa, G. (2009). Impact assessment of community radio stations in Tanzania. In: *MCT Media Research Papers Commissioned by Media Council of Tanzania*. Media Council of Tanzania.pp. 2-44.

Mtenga, K.J. (2007). Comparative analysis of strategies for linking farmers to market: Discourse on gender equity, community empowerment and soil fertility management in Malawi. Dissertation for Award of PhD Degree at University of Florida, USA.260pp.

Mugwagwa, J. (2009). Closing the blind spot towards effective science and technology innovations systems in Africa: Innovation systems-the simmering debates. Innovations systems for poverty reduction and sustainable development. *Building Bridges* 4: 11-14.

Mwakaje, A.G. (2010). Information communication technology for rural farmers market access in Tanzania. *Journal of Information Technology Impact* 10 (2): 111-128.[http://www.jiti.com/v10/jiti.v10n2.111-128.pdf] site visited on 26/11/2015.

Myhr, J. and Nordstrom, L. (2007). Livelihood changes enabled by mobile phones:The case of Tanzanian fishermen. Department of Business Studies, Uppsala University, Sweden.39pp. [http: //www. slideshare. net/sarper/livelihood-changes-enabled-by-mobile-phones-the-case-of-tanzanian-fishermen] site visited on 06/11/2013.

NBS (2012).Morogoro region agriculture sample census results-2007/2008.National Bureau of Statistics, Dar es Salaam.317pp.

Neuman, W.L. (2007). *Basics of Social Research Qualitative and Quantitative Approaches*, 2nd edition. Pearson, USA. 365pp.

Nosheen, F., Ali, T. and Ahmad, M. (2010). Analysis of gender specific sources of information regarding home and farm practices in Potohar region: A case study. *The Journal of Animal and Plant Sciences* 20: 56-59. [http:// www.thejaps.org.pk/docs/20-1-2010/Nosheen_et_al.pdf] site visited on 23/11/2011.

O'Kaine, M.P.,Paine, M.S. and King, B.J. (2008). Context, participation and discourse: The Role of the communities of practice concept in understanding farmer decision-making. *Journal of Agricultural Education and Extension* 14: 187-201.

Ogbona, O.I. and Agwu, A.E. (2013). Availability, level of use, importance and constraints to utilization of information communication technologies by farmers in Enugu state, Nigeria. *Direct Research Journal of Agriculture and Food Science*1 (4): 44-48. [http: //directresearchpublisher. org/wp-content/uploads/2015/08/Ogbonna-and-Agwu.pdf] site visited on 16/11/2014.

Oladele, O.I. (2010). Determinants of farmers' information seeking and utilization on seeds and planting materials in Lagos and Ogun States, Nigeria. *Journal of New Seeds* 11(4), 380-389.[http: //www. tandfonline. com/ doi/ full/ 10.1080/1522886X.2010.520240] site visited on 17/11/2013.

Oskam, J.B. and Hudson, J.C. (1999). Media preference and believability among rural respondents for news and advertising information. *The Social Science Journal* 36: 285-298. [http:// www.sciencedirect.com/ science/ article/pii/S0362331999000075] site visited on 23/11/2011.

Pearson, J., Nelson, P.,Titsworth, S. and Harter, L. (2003). *Human Communication*. The McGraw-Hill Companies, New York.564pp.

Perry, D. K. (2002). *Theory and Research in Mass Communication: Contexts and Consequences*. Lawrence Erlbaum Associates, Mahwal, New Jersey. 319pp.

Pigato, M. (2001). Information and communication technology, poverty and development in Sub-Saharan Africa and South Asia. Africa Region Working Paper Series No.20.82pp. [http:// documents. worldbank. org/curated/en/802851468767657623/pdf/multi0page.pdf] site visited on 05/04/2011.

Quinton, S. and Smallbone, T. (2006). *Postgraduate Research in Business: A Critical Guide*. SAGE Publications, London,U.K.183pp.

Ramírez, R. and Quarry, W. (2004). Communication for development a medium for innovation in natural resource management. International Development Center and the Food and Agriculture Organization of the United Nations, Canada.24pp.

Rao, H.R; Moore, J.C. and Whinston, A.B.(1990). A preference theory approach to decision analysis in resource allocation. *Computer Science in Economics and Management* 3:215-237.

Rashid, A.T. and Elder, L. (2009). Mobile phones and development: An analysis of IDRC-supported projects. *The Electronic Journal on Information Systems in Developing Countries* 36: 1-16. [http:// www.ejisdc.org /ojs 2/index.php/ejisdc/article/view/529/265] site visited on 09/08/2014.

Research into Use (June, 2011). Information and innovation communication platform. [http://www.researchintouse.com/programmes/riu-tanzania/riu-tz43innov infocomms.html] site visited on 21/06/2011.

Robertson, R. (2012). Globalisation or glocalisation? *Journal of International Communication* 18: 191-208. [http:/ /www. tandfonline. com/ doi/ full/10.1080/13216597.2012.709925] 19/06/2013.

Robinson, M. and Robertson, S. (2010). Young men's health promotion and new information communication technologies: illuminating the issues and research agendas. *Health Promotion International* 25(3):363-370. [http:// heapro.oxfordjournals.org/content/25/3/363] site visited on 19/06/2013.

Rodriguez, L; Supathida, K; Annamalai, D; Wright, J. and Evans, J.F. (2015). Trends in information needs and communication channel use among rural women in Africa, Asia and Latin America, 2000-2012. *Journal of Agricultural and Food Information,* 16: 221-241. [http:// www.tandfonline. com/ doi/ full/10.1080/10496505.2015.1047496] site visited on 07/05/2016.

Rogers, E.M. (1983). *Diffusion of Innovation*, 3rd edition.The Free Press, New York and London. 453p.

Rölling, N. (1996a). Towards an interactive agricultural science. *European Journal of Agricultural Education and Extension* 2:35-48.

Rölling, N. (1996b). Creating human platforms to manage natural resources: First results of a research programme. In *Agricultural R&D at the Cross-Roads: Merging Systems Research and Social Actor Approaches.(Edited by Budelman, A.)*. Royal Tropical Institute, The Netherlands.pp.149-158.

Rugg, G. and Petre, M. (2007). *A Gentle Guide to Research Methods*.The McGraw-Hill Companies, Open University Press, Berkshire, U.K. 238pp.

Samwel, J., Shah, N. and Handgham,W. (2005). Mobile community in South Africa, Tanzania and Egypt: Results from community and business surveys. The Impact of Mobile Phones. Vodafone Policy Paper Series. Issue 2. pp.44-52.

Sanga, C., Kalungwizi, V.J. and Msuya, C.P. (2013). Building an agricultural extension services system supported by ICTs in Tanzania: Progress made, Challenges remain. *International Journal of Education and Development using ICT (IJEDICT)* 9: 80-99.
[http:// ijedict.dec.uwi.edu/viewarticle.php?id=1530] site visited on 19/06/2014.

Savolainen, R. (2007). Information behaviour and information practice: reviewing the 'umbrella concepts' of information seeking studies. *The Library Quarterly* 77 109-127. [http:// eric.ed.gov/ ?redir= http%3a% 2f%2 fdx. doi.org%2f10.1086%2f517840] site visited on 29/06/2015.

Schär, S.G. and Kruger, H. (2014). Emprical research on the effect of dynamic media for information presentation.Swiss Federal , Zürich.8pp.[http://e-collection.library.ethz.ch/eserv/eth:25434/eth-25434-01.pdf] site visited on 09/08/2015.

Sebigya, B.D. and Kuzilwa ,J.A. (2010). Effects of farmers' response to formalized land conservation approaches on maize productivity in Tanzania: A case of Kilosa and Kiteto Districts. *Journal of Continuing Education and Extension* 3: 39-49.

Servae, J. and Malikhao, P. (2002). Development communication approaches in an international perspective. In *Approaches to Development*. *(Edited by Servae, J.)*. UNESCO, Paris. pp. 6-9.

Severin, W.J. and Tankard, J.W. (2001). *Communication Theories: Origins, Methods, and Uses in the Mass Media*, 5th edition. Addison Wesley Longman Inc., USA.411pp.

Sife, A.S., Kiondo, E. and Lyimo-Macha, J.G. (2010). Influence of mobile phones and broadcast media on rural communicative ecologies in Kilosa and Mvomero Districts, Tanzania. *Journal of Continuing Education and Extension* 3:1-12.

Sommers, M. (2010). Urban youth in Africa. *Environmental and Urbanization: Youth and the City* 22: 328-329.

Souter, D., Scott, N., Garforth, C., Jain, R., Mascarenhas, O. and Mckemey, K.(2005). The economic impact of telecommunications on rural livelihoods and poverty reduction: A study of rural communities in India (Gujarat), Mozambique and Tanzania. A Report of DFID Kar Project 8347.Panos London, U.K.448pp.

Swanson, B.E. (2006). Extension strategies for poverty alleviation: Lessons from China and India. *Journal of Agricultural Education and Extension* 12: 285-299.

Swanson, B.E. and Rajalanti, R. (2010). Strengthening agricultural extension and advisory systems: Procedures for assessing, transforming and evaluating extension system . Agriculture and Rural Development Discussion Paper 44. The International Bank for Reconstruction and Development/World Bank.187pp.

Tabachnick, B.G. and Fidell, L.S. (2012). *Using Multivariate Statistics*,6th edition. Pearson Education, Boston.1024pp.

Tashakkori, A .and and Teddlie, C. (2010*). Handbook of Mixed Methods in Social and Behavioural Research*, 2nd edition. SAGE publications, Los Angeles, USA.759pp.

Thomas, P. (2002). Communication and the persistence of poverty: The need for a return to basics. In *Approaches to Development*. *(Edited by Servae, J.)*. UNESCO, Paris.pp. 5-7.

UNESCO (1996). Information and Communication Technologies in Development: A UNESCO Perspective. UNESCO Secretariat, Paris.42pp.

United Republic of Tanzania (URT) (2003). Information and communication: Current situation and recommendations for strategic interventions. Agricultural Sector Development Programme Task Force 3 Working Group IC Final Report. Ministry of Agriculture Food Security and Cooperatives & FAO, Dar es Salaam, Tanzania.35pp.

United Republic of Tanzania (URT) (March 2005). Tanzania Commission of Science and Technology ICT project. [http://www.costech.or.tz/] site visited on 23/03/2011.

United Republic of Tanzania (URT) (2008). Agricultural sector reforms in Tanzania: Perspectives from within. Ministry of Agriculture Food Security and Cooperatives and FAO, Dar es Salaam, Tanzania. 353pp.

Van den Ban, A.W. (2005). Changes in society require changes in agricultural extension: Some Observations. *Rural Development News* 2:26-30.

Van Mele, P. (2006). Zooming-in zooming out: a novel method to scale up local innovations and sustainable technologies. *International Journal of Agricultural Sustainability* 4: 131-142.

Van Mele, P.,Wanvoeke, J. and Zossou, E. (2010). Enhancing rural learning, linkages, and institutions: The rice videos in Africa. *Development in Practice* 20: 419. [http://agroinsight.com/downloads/Articles-Agricultural-Extension/3_DIP%20 %20Enhancing% 20rural% 20 learning% 20and%20linkages%20-%20Van% 20Mele% 20et%20 al%202010.pdf] site visited on 29/10/2013.

Van Mele, P., (November 2011). Desperately seeking content: Why service providers increasingly search for quality agricultural training videos.[http:// extensionconference2011.cta.int/programme/session5/tools/1] site visited on 29/10/2013.

Verschuren, P. and Doorewaard, H. (2005). *Designing a Research Project*. LEMMA publisher, Utecht, The Netherlands.215pp.

Walliman, N. (2006). *Social Research Methods: Knowledge, Skills/or Success*. SAGE Publications, London.223pp.

Watson-Manheim and Blangér (2007).Media repertoires: Dealing with multiplicity of media choices. *MIS quarterly* 31 (2):267-293. [http://misq.org/cat-articles/communication-media-repertoires-dealing-with-the-multiplicity-of-media-choices.html] site visited on 29/11/2012.

Webster, T. and Trevino, L.K. (1995). Rational and social theories as complementary explanations of communication media choice: Two policy-capturing studies. *Academy Management Journal* 38(6), 1544-1572. [http:// amj.aom.org/content/38/6/1544.full] site visited on 29/11/2012.

White, S.A. (2003). Participatory video: A process that transforms the self and the other. In *Participatory Video: Images That Transform. (Edited by White, S.A.)*. Sage Publications Ltd., UK. pp.11-17.

Witteveen, L. and Enserink, B. (2007). Cultural issues and visual problem appraisal systems in India. *Knowledge, Technology and Policy* 19: 95-96.

World Bank. (2000). Agriculture in Tanzania since 1986: Follower or Leader in Growth. World Bank/IFPR, Washington DC. 167pp.

Zuku, (April, 2015). Content producers. [http://www.zuku.co.tz/about-zuku/zuku-contentseller-producer] site visited on 13/04/2015.

APPENDICES

Appendix 1: Questionnaire for community members' interview

QUESTIONNAIRE FOR COMMUNITY MEMBERS

Project Title: Communication Media Preferences by Rural Communities for Acquistion of Agricultural Information in Mvomero and Kilosa Districts, Morogoro, Tanzania

Introduction:

Dear respondent,

This questionnaire is for PhD Study whose purpose is to establish rural community members' communication media preferences for acquiring information on agricultural information in Mvomero and Kilosa Districts. Being a community member in this village you have been selected to participate by giving candid views on this issue. I therefore, kindly request your participation. Feel free to give your opinion, and respond honestly to the questions. The information you provide will be used strictly for academic reasons not otherwise. I assure you the confidentiality of your responses. Thank you for your cooperation.

District:	Division:	Ward:	Village:
Respondent's Name *(optional)*	Telephone No *(optional):*		
Gender category of respondent (check response in question no.3 to decide gender-youth category)	Woman [ ] Man [ ] Youth [ ]		
Enumerator's Name			
Questionnaire no			
Date and Time	Start Time End Time		Date:

SECTION I: GENERAL INFORMATION

1. Sex of the respondent
   1= [ ] Male
   2= [ ] Female

2. Marital status
   1= [ ] Married
   2= [ ] Not Married
   3= [ ] Other category, specify……..

3. Age of the respondent (please tick the appropriate response)
   1= [ ] 14-18 years old
   2= [ ] 19-35 years old
   3= [ ] 36-45 years old
   4= [ ] 46-60 years old
   5= [ ] 61 years old and above

4. For how long have you been living in this village? (please tick the appropriate response)
   1= [ ] since I was born
   2= [ ] for the past 10 or more years
   3= [ ] for the past 5-9 years
   4= [ ] for the past 1-4 years
   5= [ ] Less than 1 year

5. What is the highest level of education (non-religious) that you achieved? (please tick the appropriate response)
   1= [ ] Primary education
   2= [ ] Secondary education
   3= [ ] Post secondary education e.g. Certificate, diploma, degree
   4= [ ] others, specify…….

6. Which village group or association are you a member of?
   1= [ ] Women group
   2= [ ] Farmers' group
   3= [ ] Youth group
   4= [ ] others, specify……..
   5= [ ] None

7. Which of the following assets does the household possess? (please tick all those apply)
   1= [ ] Radio
   2= [ ] Television Set
   3= [ ] Mobile phone (s)
   4= [ ] Power generator
   5= [ ] Wired electricity/power
   6= [ ] Solar panel
   7= [ ] others, specify……..

8. What do you do for your livelihood? (please tick all those apply)
   1= [ ] Crop farming activities only
   2= [ ] Livestock keeping activities only
   3= [ ] Livestock and crop production activities
   4= [ ] Employee
   5= [ ] others, specify…….

9. (a) If your main agricultural activity in question (9) above is crop farming or livestock keeping and farming activities or employee and livestock keeping/crop farming activities, please rank the following crops in terms of need for information

(1=most important, 2=very important, 3=important, 4=somehow important, 5=least important)

   [ ] Vegetable, specify……..
   [ ] Maize
   [ ] Paddy
   [ ] Sweet potatoes
   [ ] Others, specify……..

(b) Please give the explanations for the ranking above

(i)Most highly ranked crop…….....
……

(ii) Least ranked crop……..
……..

(c) How many times do you cultivate the most highly ranked crop per year?
…….....

(d) What types of information do you require to grow the most highly ranked crop?
……...
……...
……...

(e) Comment on the usefulness of that information in growing mostly ranked crop
…….....
……..
……..

10. In response to question 10 (d), how do you get the information to grow the fore-mentioned most highly ranked crop?
    1= [ ] NGO representative (provide name of NGO)…….
    2= [ ] Extension officer/researcher
    3= [ ] Neighbours/friends
    4= [ ] Information media, please specify/mention……
    5= [ ] others, specify…….

(a) How much land do you own?.....Ha/Acres

(b) How was it acquired? (Please tick all that apply)

1= [ ] Inherited
2= [ ] Bought
3= [ ] Rented/Borrowed
4= [ ] others, specify…….

(c) If rented/borrowed from who? (Please tick the appropriate response)

1= [ ] Father
2= [ ] Spouse
3= [ ] Neighbour
4= [ ] Village government
5= [ ] others, specify…….

11. (a) If your main agricultural activity in question (9) above is livestock keeping or livestock keeping and farming or employee and livestock keeping/crop farming , please rank the following livestock in terms of their need for information ***(1=most important, 2=very important, 3=important, 4=somehow important, 5=least important)***

[ ] Poultry
[ ] Sheep
[ ] Goats
[ ] Dairy cattle
[ ] Others, specify……..

(b) Please give the explanations for the ranking above

(i)Most highly ranked livestock…….....
…….

(ii) Least ranked livestock……..
……
……..

(c)(i) What types of information do you require to raise the most highly ranked livestock?

……...
……
……...

(ii) Comment on the usefulness of that information in assisting to raise the most highly ranked livestock?

……

……

In response to question 13 (c), how do you get the information to raise the fore-mentioned most highly ranked livestock?

1= [ ] NGO representative (provide name of NGO)…….
2= [ ] Extension officer/researcher
3= [ ] Neighbours/friends
4= [ ] Information media, please specify/mention……
5= [ ] others, specify…….

12. For how long have you been practicing crop production/livestock keeping in this village? (please tick the appropriate response)
    1= [ ] When I was 18 years old
    2= [ ] for the past 10 or more years
    3= [ ] for the past 5-9 years
    4= [ ] for the past 1-4 years
    5= [ ] Less than 1 year

13. What is your estimated income per year?.....

SECTION II: AVAILABILITY OF COMMUNICATION MEDIA IN RURAL AREAS

14. To what extent is the following communication media available to community members in this village? Please rank the following communication media in terms of their availability (Tick the appropriate response).

(1=easily available, 3= Available with difficulties, 3=not available)

Type of Communication Media	**Ranking**			**Provide reasons for your ranking**
	1	**2**	**3**	
1. Video tapes/DVD				
2. Radio				
3.Television				
4. Mobile phones				
5. Internet				
6. Booklets				
7.Leaflets				

15. (i)Which type of communication media do you prefer for acquiring agricultural information? (Please tick the appropriate response)

Type of Communication Media	**Response**	**Provide reason (s) for your choice**
1. Video tapes/DVD	Yes [ ] No[ ]	
2. Radio	Yes [ ] No[ ]	
3.Television	Yes [ ] No[ ]	
4. Mobile phones	Yes [ ] No[ ]	
5. Internet	Yes [ ] No[ ]	
6. Booklets	Yes [ ] No[ ]	
7.Leaflets	Yes [ ] No[ ]	

(ii) If mobile phone? Which of the following mobile phone companies do you prefer most? (Please tick the appropriate response)

1= [ ] Tigo
2= [ ] Vodacom
3= [ ] Airtel
4= [ ] Zantel

(iii) Please explain your choice

……
……
……..

SECTION III: ACCESSIBILITY OF COMMUNICATION MEDIA IN RURAL AREAS

16. If the response is yes in any of the communication media in question (15) above, how frequent do you access the communication media of your preference? Please rank the following communication media in terms of frequency of access (Please check the response in question 18 and rank appropriately)

(1= frequently, 2= less frequent, 3= Not available)

Type of Communication Media	**Ranking**			**Provide reasons for your choice**	
	1	**2**	**3**		
1. Video tapes/DVD					
2. Radio					
3.Television					
4. Mobile phones					
5. Internet					
6. Booklets					
7.Leaflets					

17. If the response is yes in question (15) above, how do you access communication media of your preference? (Please check the response in question 19 and tick the appropriate response)

Type of communication media	**Means of accessing it**	**Response**
1. Video tapes/DVD	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives, extension officers/researchers, etc.	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]
2. Radio	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives, extension officers/researchers, etc.	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]
3.Television	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives, extension officers/researchers, etc.	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]
4. Mobile phones	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives, extension officers/researchers, etc.	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]
5. Internet	1= Through mobile phones	Yes [ ] No[ ]
	2=Internet café	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]
6. Booklets	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives,	Yes [ ] No[ ]

	extension officers/researchers, etc.	
	3=Others, specify……	Yes [ ] No[ ]
7.Leaflets	1= Buying	Yes [ ] No[ ]
	2=Interpersonal relationship eg.neighbours, relatives, extension officers/researchers, etc.	Yes [ ] No[ ]
	3=Others, specify……	Yes [ ] No[ ]

Socio-economic factors	**Type of communication media**	**Level of influence**		
		1	2	3
1.Age	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			
2.Gender	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			
3.Education level	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			
4. Asset ownership	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			
5.Marital status	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			
6.Income	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			

	5=Internet			
	6=Television			
	7=Mobile phones			
7.Type of farming enterprise	1=Radio			
	2=Booklet			
	3=Leaflets			
	4=Video tapes/DVD			
	5=Internet			
	6=Television			
	7=Mobile phones			

17. To what extent do the following socio-economic factors influence the accessibility and your preference for communication media? Please check the response on level of influence in table below.

(1= High Influence, 2=less influence, 3= No influence)

SECTION IV: CONTENT OF COMMUNICATION MEDIA

18. If the response is yes in question (15) above, what is your favourite information from the communication media of your preference? (Please check the response in question 18 and tick the appropriate response)

Type of communication media	**Type of information**
1. Video tapes/DVD	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
2. Radio	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
3.Television	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
4. Mobile phones	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
5. Internet	1=[ ] Entertainment information
	2=[ ] Health information

	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
6. Booklets	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….
	13= [ ] Others (Please specify)…….
7.Leaflets	1=[ ] Entertainment information
	2=[ ] Health information
	3=[ ] Agricultural information
	4=[ ] Religious information
	5=[ ] Entertainment information, health related information, agricultural related information, and religious information
	6= [ ] Others (Please specify)…….

19. If your response is agricultural information in question (18), from communication media of your preference in question (15), what type of agricultural information do you prefer most in your communication media of your preference in question 18? Please rank the following agricultural messages in terms of their importance to you
(1=most important, 2=very important, 3=important, 4=somehow important, 5=least important)

1= [ ] Marketing information
2= [ ] Information on improved crop and husbandry practices
3= [ ] Information on value addition,
4= [ ] Information on funding options
5= [ ] Other information eg. cross cutting issues-HIV, etc.

20 a)If marketing information is ranked as most important information in question 19, what type of messages on marketing information do you prefer to get from that communication media? (Please check the response in question 20(a) and tick the appropriate response.

Type of communication media	**Type of messages on marketing information**	**Response**
1. Video tapes/DVD	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]
2. Radio	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]

	7=Others, specify…..	Yes [ ] No[ ]
3. Television	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]
4. Mobile phones	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]
5.Internet	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]
6.Booklets	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]
7.Leaflets	1=Price of agricultural produce	Yes [ ] No[ ]
	2= Availability of markets	Yes [ ] No[ ]
	3=Transportation information	Yes [ ] No[ ]
	4= Quality assurance	Yes [ ] No[ ]
	5= Food safety procedures	Yes [ ] No[ ]
	6= Contract farming	Yes [ ] No[ ]
	7=Others, specify…..	Yes [ ] No[ ]

(b) If your response is information on improved crop and husbandry practices in question 19, what type of crop husbandry messages do you get from that communication media? (Please check the response in question 20(b) and tick the appropriate response)

Type of communication media	**Crop husbandry messages**	**Response**
1. Video tapes/DVD	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]
	8= Input availability, selection and use of	Yes [ ] No[

	improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	]
	9=Others (Please specify)…..	Yes [ ] No[ ]
2. Radio	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]
	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…..	Yes [ ] No[ ]
3. Television	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]
	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…..	Yes [ ] No[ ]
4. Mobile phones	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]

	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…..	Yes [ ] No[ ]
5.Internet	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]
	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…..	Yes [ ] No[ ]
6.Booklets	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[ ]
	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…..	Yes [ ] No[ ]
7.Leaflets	1=Input availability	Yes [ ] No[ ]
	2=Selection and use of improved seed varieties	Yes [ ] No[ ]
	3=Proper spacing and planting	Yes [ ] No[ ]
	4= Weather information	Yes [ ] No[ ]
	5= Management of soil fertility	Yes [ ] No[ ]
	6=Use of insecticides	Yes [ ] No[ ]
	7=Land disputes	Yes [ ] No[

		]
	8= Input availability, selection and use of improved seed varieties, proper spacing and planting, weather information, management of soil fertility, use of insecticides and land disputes	Yes [ ] No[ ]
	9=Others (Please specify)…...	Yes [ ] No[ ]

(c) If your response is information on improved crop and husbandry practices in question 19, what type of livestock husbandry messages do you prefer to get from that media? (Please check the response in question 20(c) and tick the appropriate response)

Type of media	**Livestock messages**	**Response**
1. Video tapes/DVD	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
2. Radio	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
3. Television	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks,	Yes [ ]

	etc.)	No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
4. Mobile phones	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
5.Internet	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
6.Booklets	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]

	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]
7.Leaflets	1=Feeding	Yes [ ] No[ ]
	2=Pasture management	Yes [ ] No[ ]
	3=Newcastle and other diseases control (eg.worms, ticks, etc.)	Yes [ ] No[ ]
	4=Improved housing	Yes [ ] No[ ]
	5=Feed formulation	Yes [ ] No[ ]
	6=Artificial Insemination (I.A)	Yes [ ] No[ ]
	7=Feeding, pasture management, Newcastle and other diseases control, improved housing, feed formulation and Artificial Insemination (A.I.)	Yes [ ] No[ ]
	8=Others (Please specify)….	Yes [ ] No[ ]

(d) If information on value addition is ranked as most important information in question 19, what type of messages on value addition do you prefer to get from that communication media? (Please check the response in question 20(d) and tick the appropriate response)

Type of communication media	**Type of messages on value addition**	**Response**
1. Video tapes/DVD	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
2. Radio	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
3. Television	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
4. Mobile phones	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
5.Internet	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
6.Booklets	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]

	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
7.Leaflets	1= value addition	Yes [ ] No[ ]
	2= ware house facilities	Yes [ ] No[ ]
	3=Grading	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]

(e) If information of funding options is ranked as most important information in question 19, what type of messages on funding options do you prefer to get from that communication media? (Please check the response in question 20(e) and tick the appropriate response)

Type of communication media	**Type of messages on funding options**	**Response**
1. Video tapes/DVD	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
2. Radio	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
3. Television	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
4. Mobile phones	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
5.Internet	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
6.Booklets	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]
7.Leaflets	1=Subsidies	Yes [ ] No[ ]
	2= Availability of credits/loans	Yes [ ] No[ ]
	3=Availability of grants	Yes [ ] No[ ]
	4= Others (Please specify)….	Yes [ ] No[ ]

(f) If other information is ranked as most important information in question 19, what type of other information messages do you prefer to get from that communication media? (Please check the response in question 20(f) and tick the appropriate response)

Type of communication media	**Type of other agricultural messages**	**Response**
1. Video tapes/DVD	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
2. Radio	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
3. Television	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
4. Mobile phones	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
5.Internet	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
6.Booklets	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]
7.Leaflets	1= Information HIV/AIDs	Yes [ ] No[ ]
	2= Information on good governance	Yes [ ] No[ ]
	3= Others (Please specify)….	Yes [ ] No[ ]

SECTION V: FACTORS INFLUENCING UTILISATION OF COMMUNICATION MEDIA

21 (a) What constraint (s) do you face if any when using the communication media of your preference in question (15) above? Please indicate the magnitude of the constraints by checking the appropriate column.

(1=major constraint, 2=constraint, 3=somewhat a constraint, 4=not a constraint, 5=don't know)

S/No	Constraints for community members to prefer communication media	Magnitude of the constraint				
		1	2	3	4	5
1	Lack of essential skill and knowledge in designing and using communication media					
2	Reliability of agricultural information					
3	Suspiciousness on using communication tools due to their susceptibility to damage					
4	Unreliable power supply					
5	Distance from community/regional libraries and other accessories (eg.vouchers, electronic equipment spare parts, decoders, etc.)					
6	Use of difficult language in communication media					
7	Low level of income					
8	Speculation on associated health risks (eg. Emission of dangerous waves in televisions/video/radio, use of dangerous ink on papers, etc.)					
9	Poor communication policies					
10	Others (Please specify)…….					

(b) How do you resolve major constraints (s)?

……
……
……
……
……

22) In response to question 15, how does the following style of information presentation on media influence your perception for utilisation of communication medium (media)? (Please indicate the level of your agreement with provided statements by checking the appropriate column).

(1=strongly agree, 2=agree, 3=don't know, 4=disagree, 5=strongly disagree)

Statements on respondents perception on how the style of information presentation influences their perception on utilization of communication media	**Respondents' responses on their level of agreement**				
	1	2	3	4	5
1=Community members positively perceive the presentation of agricultural information in form of good pictures (still/moving) and voice on the communication medium as this kind of combination influences them to utilize such medium					
2=The most positively perceived utilised communication medium is the one that presents agricultural information in form of different coloured pictures and text					
3=Community members positively perceive that any communication medium that presents agricultural information in form of cartoon becomes mostly utilised					
4=Most of community members positively perceive that the presentation of agricultural information in form of drama (textual drama and audio visual drama) on communication medium derive their satisfaction on utilization of such medium					
5=Presentation of agricultural information using black text on white papers without decorations impacts community members' mental faculty negatively, hence this affects the utilizability such print media in the rural community					

SECTION VI: SUGGESTIONS

23. Please give your opinions on the reliability of the following in your area:

(a) Source of power for your mobile phone/ radio or television?

.....

(b) Mobile telephony network coverage?

……

(c) How do you handle problems related to power supply and network coverage?

……

(d) Give your opinions about your perceptions on the usefulness of the following information media?

(i) Radio

……

……

(ii) Video

……

……

(iii) Leaflets

……

(iv) Internet

……

(v) Booklets

……

……

(vi) Television

……

……

(vii) Mobile phone

……

……

"THANK YOU FOR YOUR COOPERATION"

Appendix 2: Checklist for researchers, breeders, NGOs and information providers

Project Title: Communication Media Preferences by Rural Communities for Acquistion of Agricultural Information in Mvomero and Kilosa Districts, Morogoro, Tanzania

Name of key informant :……..(*optional)*

Mobile telephone no:…….

Title/Designation:…….

QUESTIONS FOR KEY INFORMANT INTERVIEW WITH RESEARCHERS AND INFORMATION PROVIDERS

A: Availability of communication media

1. Which communication media do you use to disseminate your agricultural research findings/agricultural information?
2. What communication media would you prefer most in communicating agricultural information? Why?
3. How does available agricultural information influence men, women and youths preference for communication media used? Explain.
4. What knowledge products have you produced in the past three to five years?
5. How do you consider gender issues when preparing communication media?
6. At which stage did the stakeholders participate in preparation of these communication media? And why?

   a=Problem Identification;

b=Technology Development;

c=Evaluation stage;

d=Dissemination stage

7. What target group information needs did you address through those communication media?

B: The influence of socio-economic factors to preference for communication media

8. Which crop/animal packages are mostly adopted among men, women and youths in the area? Explain
9. To what extent do you share knowledge and experiences within your institutions and with the target group during communication media design and use?

C: Constraints on access to communication media

10. What are problems encountered when using communication media?
11. What do you think are the major barriers for effective utilization of electronic media for agricultural development of rural Tanzania?
12. Please give your opinions on the reliability of the following in your area:
    (a) Source of power for your mobile phone/ radio or television?
    (b) Mobile telephony network coverage?
    (c) How do you handle problems related to power supply and network coverage?

D: Quality of information on the communication media

13. Training on communication media use

    a) Did you receive any training on production and use of education media? Yes/No

    b) If yes, what kind of training did you receive in relation to media activities?

    c) How do you assess yourself in terms of promoting technology through communication media to target group?

14. a) Are community members coming to you to seek for assistance for using information obtained from media they possess?

    b) If yes, how do you assist them? If no, why do you think they are not coming to

    seek for advice?

15. How do you make follow up to determine if the end users understand the message?

16. In reference to printed materials and electronic media, please give your views on the content in reference to the following:

    a) Clarity of message

    b) Language use in message

    c) How do farmers say in terms of applicability of the message?

17. Give your opinions about community members' perceptions on the usefulness of the following information media?

    (i) Radio

    (ii) Video/DVD

    (iii) Leaflets.

(iv) Internet

(v) Booklets

(vi) Television

(vii)Mobile phone

E: Suggestions

18. What do you suggest to improve future design of communication media to suit the gender groups in the rural community?

"THANK YOU VERY MUCH FOR YOUR COOPERATION"

Appendix 3: Checklist for extension officers and village leaders/executives

Project Title: Communication Media Preferences by Rural Communities for Acquistion of Agricultural Information in Mvomero and Kilosa Districts, Morogoro, Tanzania

Name of key informant :……..(*optional)*

Mobile telephone no:……

Title/Designation:……..

QUESTIONS FOR KEY INFORMANT INTERVIEW WITH LOCAL GOVERNMENT OFFICIALS IN STUDY VILLAGES

A: Availability of communication media

1. Which communication media do you prefer to use in disseminating agricultural information?
2. What information media would you prefer most in communicating agricultural information to farmers? Why?

B: The influence of socio-economic factors to preference for communication media

3. Who access to communication media among men, women and youths in the rural community?
4. How does community members' socio-economic characteristics such as age, gender, marital status, educational level, income, asset ownership and type of farming enterprise influence access to communication media in ensuring adoption of agricultural practices?

C: Constraints on access to communication media

19. What do you think are the major barriers for effective utilization of print and electronic media for agricultural development of rural Tanzania?
20. Please give your opinions on the reliability of the following in your area:
    a) Source of power for your mobile phone/ radio or television?
    b) Mobile telephony network coverage?
    c) How do you handle problems related to power supply and network coverage?

D: Quality of information on the communication media

21. What do farmers say in terms of applicability of the message in information media?
22. How do you assist community members coming to seeking assistance in using information obtained from media they possess?
23. How do you make follow up to determine if the end users understand the message?
24. To what extent do you share knowledge and experiences with the target group during communication media design and use?
25. Give your opinions about community members' perceptions of the usefulness of the following information media?
    (i) Radio
    (ii) Video/DVD
    (iii) Leaflets.
    (iv) Internet

(v) Booklets

(vi) Television

(vii) Mobile phone

E: Suggestions

26. What do you suggest to improve future design of communication media to suit the gender groups (i.e men, women and youths) in the rural community?

"THANK YOU VERY MUCH FOR YOUR COOPERATION"

Appendix 4: Checklist for FGDs with community members

Project Title: Communication Media Preferences by Rural Communities for Acquistion of Agricultural Information in Mvomero and Kilosa Districts, Morogoro, Tanzania

Name of village:……..

Gender category (tick appropriate response) Men [ ] Women [ ] Youth [ ]

Group number (how many members per group):…….

Date of discussion:……

QUESTIONS FOR FOCUS GROUP DISCUSSION IN STUDY VILLAGES

A: Availability of communication media

1. What are the local sources of agricultural information?
2. What are the external sources of agricultural information?
3. What are the available media (knowledge sharing products) in your village?
4. How did you become aware of the availability of media in your village?

B: The influence of socio-economic factors to preference for communication media

5. How do the following factors influence your preference to media (knowledge sharing product)? Explain

Socio-economic factors	Explain
i. Your sex	
ii. Your education level	
iii. Your marital status	
iv. Your age	
v. Your religion	
vi. Type of crop grown/livestock kept	
vii. Your level of income	
viii. Your farming experience	
ix. Your farm size	
x. Land ownership	
xi. Social networks	

C: Constraints on access to communication media

6. Who are more attached to social networks among the following community members: men, women or youths? Explain.
7. Which group among the following men, women and youths do you think are benefiting more from information media in your community? And why?

D: Quality of information on the communication media

8. How valid are claims in the printed media?
9. How do you say on the language use and clarity of message in the selected media of your choice?
10. How do others say in terms of applicability of the message from selected media of your choice?

11. What are the formal organisations that convey information to community members and how are beneficiaries of this information selected?
12. How long are television or radio programmes and how focused are they?

E: Preference for communication media

13. Which among the following communication media do men, women and youths prefer in accessing agricultural information in your community? Give your opinions

(i) Radio

(ii) Video/DVD

(iii) Leaflets.

(iv) Internet

(v) Booklets

(vi) Television

(v) Mobile phone

F: Suggestions

14. Are there any ideas you would like to share?

"THANK YOU VERY MUCH FOR YOUR COOPERATION"

Appendix 5: Observation scheme

Project Title: Project Title: Communication Media Preferences by Rural Communities for Acquistion of Agricultural Information for Mvomero and Kilosa Districts, Morogoro, Tanzania

Name of village:……..

Date of observation:……

S/No	Items to be observed	Details
1	Availability of: (i) Radio (ii) Video/DVD (iii) Leaflets. (iv) Internet (v) Booklets (vi) Television	
2	Level of telephone services coverage in the community i.e mobile phone and fixed line telephones	
3	Availability of solar power panels	
4	Electronic media infrastructure eg. telephone lines, satellite dishes, mobile phone towers.	
5	Access to electricity	
6	Conditions of road	
7	Availability of market infrastructure	
8	Availability of dip-tanks, charco-dam, etc.	
9	Availability of locally produced media products	
10	Check business days/hours of community farmers' groups/associations offices, extension agents' offices, microfinance institutions, input supplies shop	
11	Other media products/services available in the community eg. CD-Roms, community radio stations, Internet café	
12	Check price of inputs and produce in the local shops and markets and credit interest rates	
13	Type of houses where the respondents live	
14	Participation in the workshop or Focus Group Discussion (enthusiasm and inquisitiveness, asking for clarification)	
15	Problems mostly encountered in listening/ watching video and reading print media	
16	Most preferred information material by different gender groups and reasons for their preference	
17	Persuasion elements in the print/electronic media (how appealing is the information packaged in media)	

Appendix 6: Research clearance letter from SUA to Kilosa District

KIBALI CHA KUFANYA UTAFITI NCHINI TANZANIA

CHUO KIKUU CHA SOKOINE CHA KILIMO
OFISI YA MAKAMU WA MKUU WA CHUO MOROGORO
S.L.P 3000, MOROGORO, TANZANIA
Simu: 023-2604523/2603511-4; Fax: 023-2604651, MOROGORO

Kumb.Zetu: SUA/ADM/R.18 **Tarehe:** 17/05/2012

Mkurugenzi Mtendaji wa Wilaya
KILOSA

UTAFITI WA WATAFITI, WAALIMU NA WANAFUNZI WA CHUO KIKUU

Madhumuni ya barua hii ni kumtambulisha kwako Ndugu **Innocent M.Busindi** ambaye ni mwanafunzi wa Chuo Kikuu cha Sokoine cha Kilimo. Ndugu huyo hivi sasa yumo katika shughuli za utafiti **wa shahada ya uzamivu (PhD).**

Chuo Kikuu cha Sokoine cha Kilimo (SUA) kilianzishwa na Sheria ("Universities Act No.5 of 2005") na Hati Ridhia ("SUA Charter, 2007") ambayo ilianza kutumika Januari 1, 2007. Hati Ridhia ilichukua nafasi ya Sheria Na.6 ya mwaka 1984. Moja ya majukumu ya SUA ni kufanya tafiti mbalimbali na kutumia matokeo ya tafiti hizo. Kwa sababu hiyo, waalimu, wanafunzi na watafiti wa chuo hufanya tafiti mbalimbali katika nyakati zinazostahili.

Ilikufanikisha utekelezaji wa tafiti hizo Makamu wa Chuo SUA amepewa mamlaka ya kutoa vibali vya kufanya utafiti nchini kwa waalimu, wanafunzi na watafiti wake kwa niaba ya Serikali na Tume ya Sayansi na Tekinolojia.

Hivyo basi tunaomba umpatie mwanafunzi aliyetajwa hapo juu msaada atakaohitaji ili kufanikisha uchunguzi wake. Gharama za malazi na chakula chake pamoja na usafiri wake atalipia mwenyewe kutokana na fedha alizopewa na Chuo Kikuu. Msaada anaohitaji zaidi ni kuruhusiwa kuonana na viongozi na wananchi ili aweze kuzungumza nao na kuwauliza maswali aliyo nayo.

Kiini cha Utafiti wa mwanafunzi aliyetajwa hapo ni kutafiti ***'Kiini cha Upendeleo wa Njia za Kupata Habari Katika Uzalishaji wa Mazao na Mifugo Baina ya Jamii za Vijijijini Katika Wilaya za Kilosa na Mvomero*" (Rural Community Members' Media Preferences for Information on Agricultural Production in Mvomero and Kilosa Districts).**

Sehemu anazofanyia huo utafiti ni **Wilaya za Kilosa na Mvomero.**

Ikiwa kuna baadhi ya sehemu ambazo zinazuiliwa ni wajibu wako kuzuia zisitembelewe.

Muda wa utafiti huo ni kuanzia **Mei, 2012** hadi **Mei, 2013.**

Ikiwa utahitaji maelezo zaidi tafadhali wasiliana nami.

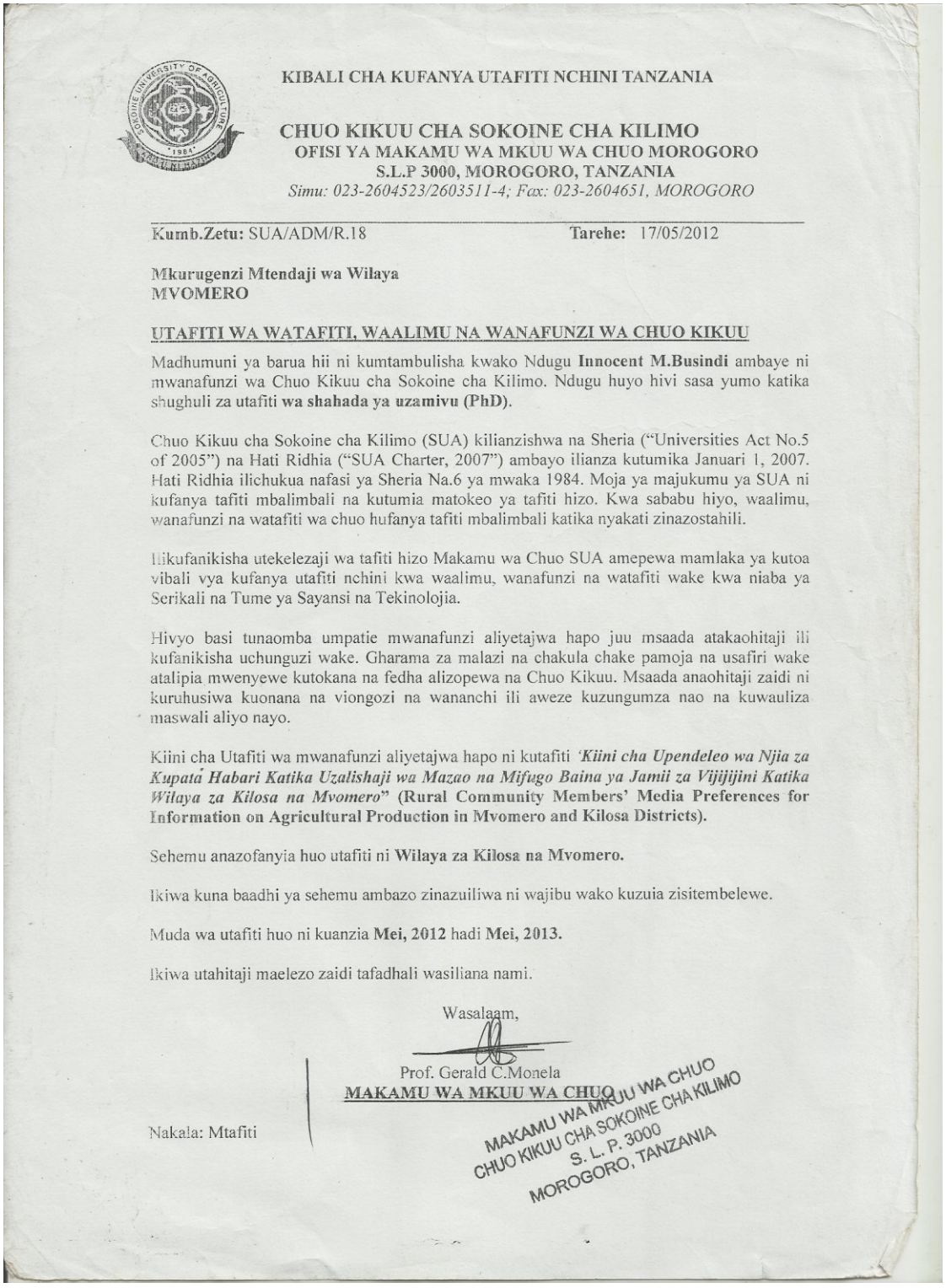
Wasalaam,

Prof. Gerald C.Monela
MAKAMU WA MKUU WA CHUO

MAKAMU WA MKUU WA CHUO
CHUO KIKUU CHA SOKOINE CHA KILIMO
S. L. P. 3000
MOROGORO, TANZANIA

Nakala: Mtafiti

Appendix 7: Research clearance letter from SUA to Mvomero District council



KIBALI CHA KUFANYA UTAFITI NCHINI TANZANIA

CHUO KIKUU CHA SOKOINE CHA KILIMO
OFISI YA MAKAMU WA MKUU WA CHUO MOROGORO
S.L.P 3000, MOROGORO, TANZANIA
Simu: 023-2604523/2603511-4; Fax: 023-2604651, MOROGORO

Kumb.Zetu: SUA/ADM/R.18 **Tarehe:** 17/05/2012

Mkurugenzi Mtendaji wa Wilaya
MVOMERO

UTAFITI WA WATAFITI, WAALIMU NA WANAFUNZI WA CHUO KIKUU

Madhumuni ya barua hii ni kumtambulisha kwako Ndugu **Innocent M.Busindi** ambaye ni mwanafunzi wa Chuo Kikuu cha Sokoine cha Kilimo. Ndugu huyo hivi sasa yumo katika shughuli za utafiti **wa shahada ya uzamivu (PhD).**

Chuo Kikuu cha Sokoine cha Kilimo (SUA) kilianzishwa na Sheria ("Universities Act No.5 of 2005") na Hati Ridhia ("SUA Charter, 2007") ambayo ilianza kutumika Januari 1, 2007. Hati Ridhia ilichukua nafasi ya Sheria Na.6 ya mwaka 1984. Moja ya majukumu ya SUA ni kufanya tafiti mbalimbali na kutumia matokeo ya tafiti hizo. Kwa sababu hiyo, waalimu, wanafunzi na watafiti wa chuo hufanya tafiti mbalimbali katika nyakati zinazostahili.

Ilikufanikisha utekelezaji wa tafiti hizo Makamu wa Chuo SUA amepewa mamlaka ya kutoa vibali vya kufanya utafiti nchini kwa waalimu, wanafunzi na watafiti wake kwa niaba ya Serikali na Tume ya Sayansi na Tekinolojia.

Hivyo basi tunaomba umpatie mwanafunzi aliyetajwa hapo juu msaada atakaohitaji ili kufanikisha uchunguzi wake. Gharama za malazi na chakula chake pamoja na usafiri wake atalipia mwenyewe kutokana na fedha alizopewa na Chuo Kikuu. Msaada anaohitaji zaidi ni kuruhusiwa kuonana na viongozi na wananchi ili aweze kuzungumza nao na kuwauliza maswali aliyo nayo.

Kiini cha Utafiti wa mwanafunzi aliyetajwa hapo ni kutafiti *'Kiini cha Upendeleo wa Njia za Kupata Habari Katika Uzalishaji wa Mazao na Mifugo Baina ya Jamii za Vijijijini Katika Wilaya za Kilosa na Mvomero"* **(Rural Community Members' Media Preferences for Information on Agricultural Production in Mvomero and Kilosa Districts).**

Sehemu anazofanyia huo utafiti ni **Wilaya za Kilosa na Mvomero.**

Ikiwa kuna baadhi ya sehemu ambazo zinazuiliwa ni wajibu wako kuzuia zisitembelewe.

Muda wa utafiti huo ni kuanzia **Mei, 2012** hadi **Mei, 2013.**

Ikiwa utahitaji maelezo zaidi tafadhali wasiliana nami.

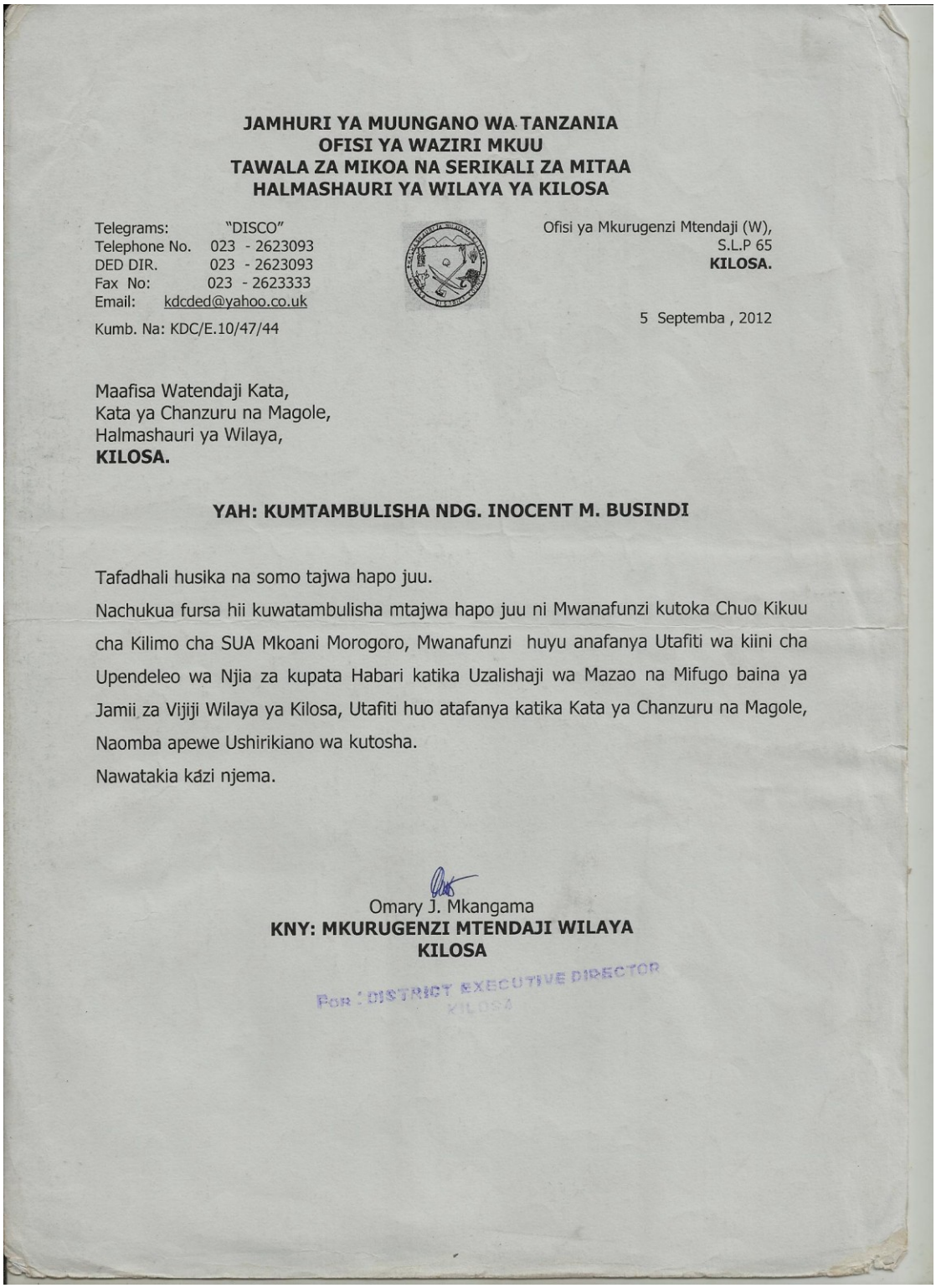
Wasalaam,

Prof. Gerald C.Monela
MAKAMU WA MKUU WA CHUO

MAKAMU WA MKUU WA CHUO
CHUO KIKUU CHA SOKOINE CHA KILIMO
S. L. P. 3000
MOROGORO, TANZANIA

Nakala: Mtafiti

Appendix 8: Research clearance letter, Kilosa District council



JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA WAZIRI MKUU
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA WILAYA YA KILOSA

Telegrams: "DISCO"
Telephone No. 023 - 2623093
DED DIR. 023 - 2623093
Fax No: 023 - 2623333
Email: kdcded@yahoo.co.uk

Kumb. Na: KDC/E.10/47/44

Ofisi ya Mkurugenzi Mtendaji (W),
S.L.P 65
KILOSA.

5 Septemba , 2012

Maafisa Watendaji Kata,
Kata ya Chanzuru na Magole,
Halmashauri ya Wilaya,
KILOSA.

YAH: KUMTAMBULISHA NDG. INOCENT M. BUSINDI

Tafadhali husika na somo tajwa hapo juu.

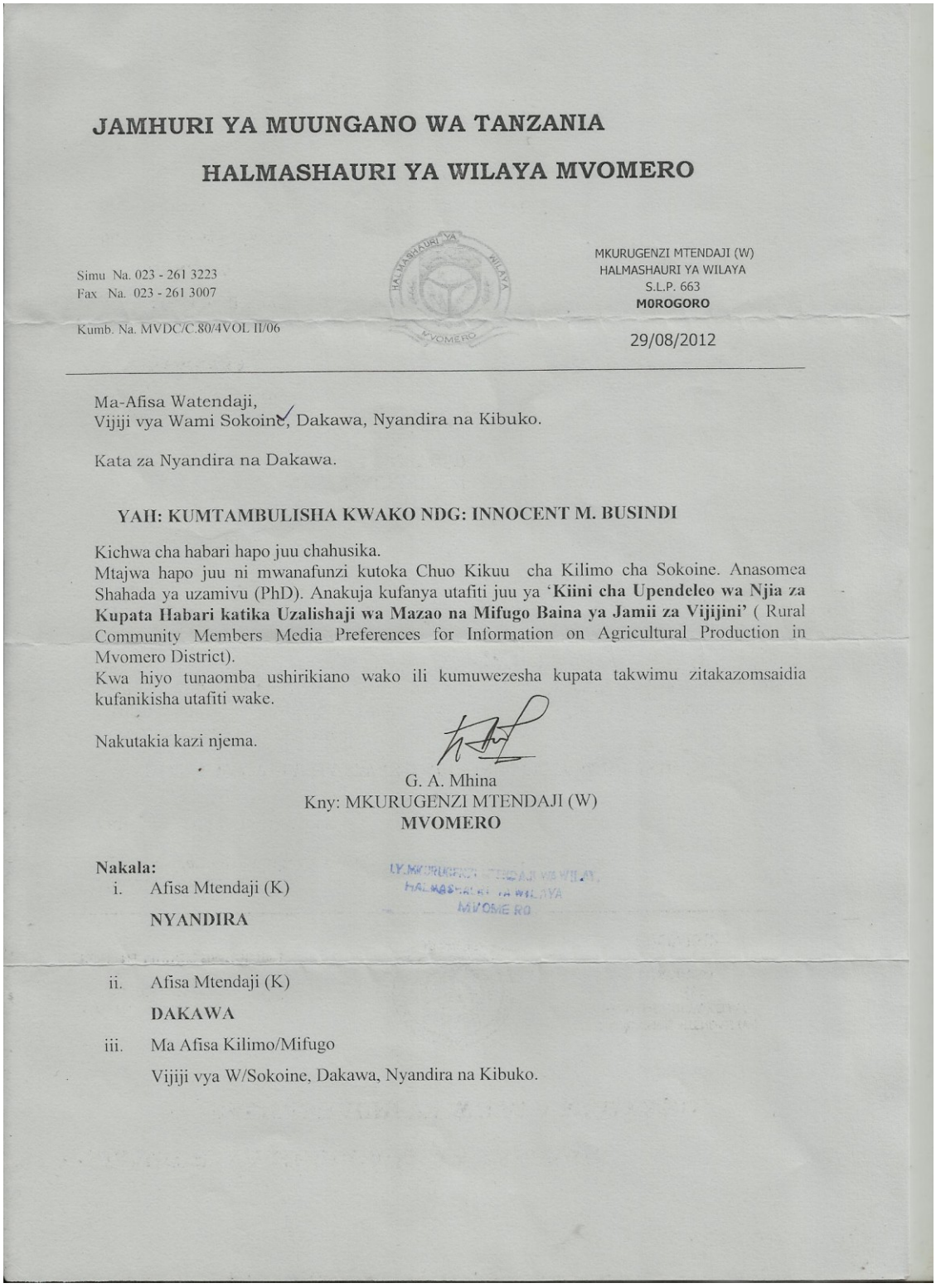
Nachukua fursa hii kuwatambulisha mtajwa hapo juu ni Mwanafunzi kutoka Chuo Kikuu cha Kilimo cha SUA Mkoani Morogoro, Mwanafunzi huyu anafanya Utafiti wa kiini cha Upendeleo wa Njia za kupata Habari katika Uzalishaji wa Mazao na Mifugo baina ya Jamii za Vijiji Wilaya ya Kilosa, Utafiti huo atafanya katika Kata ya Chanzuru na Magole, Naomba apewe Ushirikiano wa kutosha.

Nawatakia kazi njema.

Omary J. Mkangama
KNY: MKURUGENZI MTENDAJI WILAYA
KILOSA

FOR: DISTRICT EXECUTIVE DIRECTOR
KILOSA

Appendix 9: Research clearance letter, Mvomero District council



JAMHURI YA MUUNGANO WA TANZANIA

HALMASHAURI YA WILAYA MVOMERO

Simu Na. 023 - 261 3223
Fax Na. 023 - 261 3007

Kumb. Na. MVDC/C.80/4VOL II/06

MKURUGENZI MTENDAJI (W)
HALMASHAURI YA WILAYA
S.L.P. 663
M0ROGORO

29/08/2012

Ma-Afisa Watendaji,
Vijiji vya Wami Sokoine, Dakawa, Nyandira na Kibuko.

Kata za Nyandira na Dakawa.

YAH: KUMTAMBULISHA KWAKO NDG: INNOCENT M. BUSINDI

Kichwa cha habari hapo juu chahusika.
Mtajwa hapo juu ni mwanafunzi kutoka Chuo Kikuu cha Kilimo cha Sokoine. Anasomea Shahada ya uzamivu (PhD). Anakuja kufanya utafiti juu ya '**Kiini cha Upendeleo wa Njia za Kupata Habari katika Uzalishaji wa Mazao na Mifugo Baina ya Jamii za Vijijini'** (Rural Community Members Media Preferences for Information on Agricultural Production in Mvomero District).
Kwa hiyo tunaomba ushirikiano wako ili kumuwezesha kupata takwimu zitakazomsaidia kufanikisha utafiti wake.

Nakutakia kazi njema.

G. A. Mhina
Kny: MKURUGENZI MTENDAJI (W)
MVOMERO

Nakala:
i. Afisa Mtendaji (K)
NYANDIRA

ii. Afisa Mtendaji (K)
DAKAWA

iii. Ma Afisa Kilimo/Mifugo
Vijiji vya W/Sokoine, Dakawa, Nyandira na Kibuko.

Appendix 10: List of leaflets and booklets analysed: NA1-3

NA1

WIZARA YA KILIMO, CHAKULA NA USHIRIKA

UTEKELEZAJI WA MRADI WA KUTHIBITISHA TEKNOLOJIA YA UZALISHAJI WA ZAO LA MPUNGA KWA TIJA ZAIDI KUTUMIA MFUMO WA SHADIDI/SRI KATIKA MAZINGIRA YA TANZANIA (WILAYA ZA KILOSA NA MVOMERO, MOROGORO)

Mradi huu unatekelezwa na watafiti kutoka Wizara ya Kilimo, Chakula na Ushirika kupitia Kituo cha Utafiti Kilimo cha Chollima (Dakawa); Kitengo cha Umwagiliaji Kanda ya Morogoro (Irrigation Zonal Unit, Morogoro) na Idara ya Elimu na Ushauri Kilimo, Chuo Kikuu cha Kilimo cha Sokoine (SUA) wakishirikiana na wakulima wadogo, viongozi na wataalam wa ugani katika ngazi za vijiji husika.

Umefadhiliwa na Serikali ya Jamhuri ya Muungano wa Tanzania kupitia Tume ya Sayansi na Teknolojia (COSTECH)

NA2

Natural Resources Institute

RUTUBISHA UDONGO NA DHIBITI VIDUHA KWA KUTUMIA MAREJEA

Kimetayarishwa kwa Ushirikiano kati ya
Kituo cha Utafiti wa Kilimo, Ilonga
S L. P. 33, Kilosa
Simu: 023 2623201
Fax: 023 2623284
Barua pepe: ilonga@iwayafrica.com
Na
NRI, Silsoe Research Institute - UK
CIMMYT, INADES Formation Tanzania, SUA, Wilaya ya Muheza, Kituo cha Utafiti wa Kilimo, Mlingano

WIZARA YA KILIMO, CHAKULA NA USHIRIKA (MAFCS)

NA3

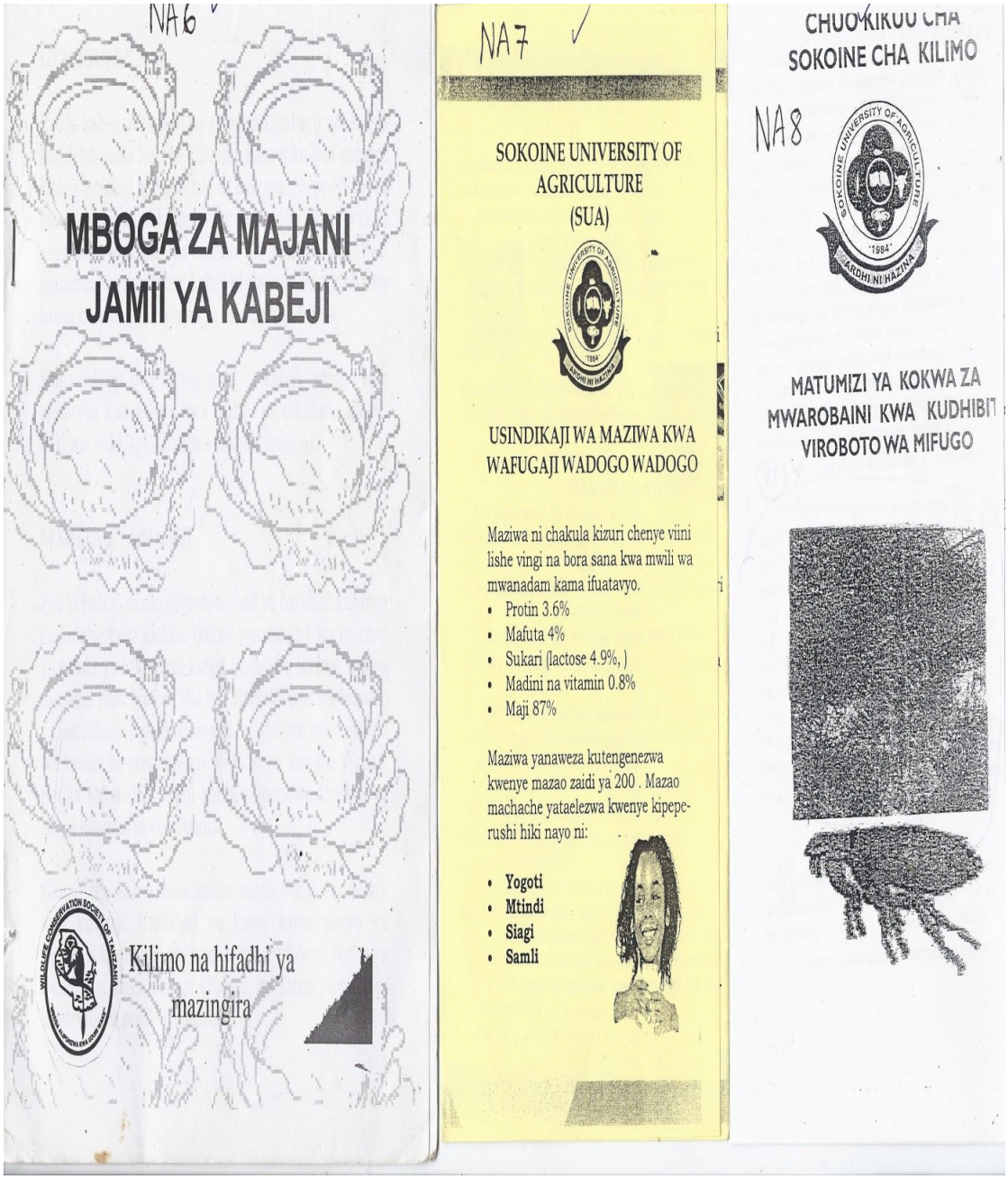
MRADI WA CHUO CHA KILIMO-MOSHI AWAMU YA PILI

Wakulima wakipalilia kwa kutumia kipalizi cha mkono

Chuo cha Kilimo Moshi

Japan International Cooperation

Appendix 11: List of leaflets and booklets analysed: NA6-8



Appendix 12: List of leaflets and booklets analysed: NA4-5

NA 5

MWONGOZO WA KILIMO CHA UYOGA KUKABILIANA NA ATHARI ZA MABADILIKO HALI YA HEWA NA TABIANCHI, TANZANIA

CCIAM
Climate Change Impacts, Adaptation and Mitigation (CCIAM) Programme in Tanzania

Kimetolewa na Mradi unaofadhiliwa na Programu ya Kujenga uwezo wa Kudhibiti na Kukabiliana na Athari za Mabadiliko Hali ya Hewa na Tabianchi, Tanzania (CCIAM),Chuo Kikuu cha Kilimo cha Sokoine, P.O.Box 3151 Chuo Kikuu, Morogoro, Tanzania. Barua pepe: drpgs@suanet.ac.tz and cciam@suanet.ac.tz; Tovuti: www.suanet.ac.tz/cciam

NA 4

TEKNOLOJIA ZA UZALISHAJI WA MUHOGO

MAHITAJI NA UZALISHAJI WA MUHOGO

PROGRAMU YA PANTIL
CHUO KIKUU CHA SOKOINE CHA KILIMO,
MOROGORO

Appendix 13: Flesch Index of the analysed articles: NA1-NA8

Results for the articles analysed

S/No	Article No	Calculation of Reading Ease (RE)	RE Score
1	NA1	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=22 words (sentence 1); 46 words (sentence 2); 13 words (sentence 3); 9 words (sentence 4) Word length=Number of syllables per word=5 +3 +2 +3 +7 +9 +2 +8 +6 +4 +10 +2 +8 +11 +2 +9 +8 +6 +6 +4 +2 +4 = 121 Number of sentences=4: Therefore, sentence length=number of words in sentence=9 +13 +22 +46=90 R.E=206.84 – (93.17) – (83.70) =29.97	29.97
2	NA2	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=21 words (sentence 1); 13 words (sentence 2); 12 words (sentence 3) Word length=Number of syllables per word=7 +11 +4 +3 +6 +8 +4 +16 +6 +2 +7 +6 +6 +2 +3 +6 +9 +6+3 +2 +6 = 123 Number of sentences=3: Therefore, sentence length=number of words in sentence=21 +13 +12=46 R.E=206.84 – (84.61) – (42.78) =79.4	79.4
3	NA3	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=35 words (sentence 1); 51 words (sentence 2); 16 words (sentence 3); 19 words (sentence 4) Word length=Number of syllables per word=8 +2 +6 +2 +4 +5 +2 +8 +10 +8 +6 +2 +9 +4 +8 +2 +4 +5+6 +2 +7 +6 +3 +2 +11 +3 +5 +2 +5 +4 +13 +2 +4 +14= 190 Number of sentences=4: Therefore, sentence length =number of words in sentence=19 + 16 +35 +51=121 R.E=206.84 – (146.30) – (112.53) =-48.01	-48.01

4	NA4	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=10 words (sentence 1); 10 words (sentence 2); 15 words (sentence 3); 16 words (sentence 4); 14 words (sentence 5); 17 words (sentence 5) Word length=Number of syllables per word=7 +2 +6 +4 +4 +2 +7 +6 +2 +5 = 45 Number of sentences=6: Therefore, sentence length =number of words in sentence=15 + 10 + 16 + 10 +14 +17=82 R.E=206.84 – (3.465) – (12.731) =95.93	95.93
5	NA5	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=23 words (sentence 1); 10 words (sentence 2); 13 words (sentence 3); 20 words (sentence 4); 8 words (sentence 5) Word length=Number of syllables per word=7 + 9 +9 + 4 +5 +4 +8 +2 +10 +2 +5 +4 +3 + 4 +2 +5 +6 +5 +6 +6 +2 +4 +5 = 117 Number of sentences=5: Therefore, sentence length =number of words in sentence=8 + 20 + 13 +23 +10=74 R.E=206.84 – (90.09) – (67.82) =48.93	48.93
6	NA6	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=14 words (sentence 1); 12 words (sentence 2); 19 words (sentence 3); 8 words (sentence 4); 9 words (sentence 4) Word length=Number of syllables per word= 6 +7 +9 +6 +2 +5 +5 +7 +11 +6 +4 +5 +2 +5= 80 Number of sentences=5 Sentence length=number of words in sentence=19 + 8 + 14 +12 +9=62 R.E=206.84 – (61.60) – (57.66) =87.58	87.58
7	NA7	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=16 words (sentence 1); 9words (sentence 2); 12 words (sentence 3)	107.85

		Word length=Number of syllables per word=6 +2 +6 +3 +11 +4 +4 +6 +6 +5 +3 +2 +6 +8+6 +8 = 84 Number of sentences=3: Therefore, sentence length =number of words in sentence=12 + 9 +16 =37 R.E=206.84 – (64.68) – (34.31) =107.85	
8	NA8	R.E=206.84-(1.015 x ASL)-(84.6 x ASW) Number of words in a sentence=20 words (sentence 1); 19 words (sentence 2); 15 words (sentence 3); 28 words (sentence 4) Word length=Number of syllables per word=3 +5 +5 +8 +5 +8 +9 +10 +3 +8 +9 +7 +2 +3 +2 +8 +5 +7+8 +4= 120 Number of sentences=4: Therefore, sentence length =number of words in sentence=20 + 19 +15 +28=82 R.E=206.84 – (92.40) – (76.26) =38.18	38.18
TOTAL SCORE		Summation: NA1+ NA2+ NA3+ NA4+ NA5+ NA6+ NA7+ NA8/8=∑R.E/8=29.97 + 79.45 + -48.01 +95.93 +48.93+ 87.58 + 107.85 +38.18 /8= 54.99; Therefore, R.E is equal to 54.99	

Appendix 14: Research methodology framework

Objectives	Research Questions	Data Required (variables)	Data Collection Methods	Analysis
1. To assess the influence of availability od communication media on rural communities' preferences for communication media in print, broadcast and electronic formats.	1.1 What are the available communication media in print, broadcast and electronic formats for use in rural communities?	1.1.1 Type of available communication media within the rural community	1.1.1 Focus Group Discussions involving community members (5-7 members per FGD) 1.1.1 Direct observation using observation guide 1.1.1 Key Informant Interview (KII) (with 7 extension officers) 1.1.1 Semi-structured questionnaire survey (240 respondents selected using proportionate and random sampling)	1.1.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo) 1.1.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16
	1.2 What are the factors that influence availability of communication media in print, broadcast and electronic formats in rural communities?	1.2 .1 The influence of infrastructure and power sources on the availability of print, broadcast and electronic communication media in rural communities	1.2.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 1.2.1 Direct observation using observation guide	1.2.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16 1.2.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
	1.3 How does the availability of communication media influence preferences for communication media by men, women and youths in rural communities?	1.3.1 Relationship between availability and community members (men, women and youth) preferences for print, broadcast and electronic communication media	1.3.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques)	1.3.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16
2. To determine the influence of accessibility of communication media on preferences for communication media in print, broadcast and electronic formats by rural community members.	2.1 What are the accessible communication media for use in rural communities?	2.1 Accessible communication media	2.1.1 Focus Group Discussions involving community members (5-7 members per FGD) 2.1.1 Direct observation using observation guide 2.1.1 Key Informant Interview (KII) (with 7 extension officers) 2.1.1 Semi-structured questionnaire survey (240 respondents selected using proportionate and random sampling)	2.1.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo) 2.1.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16
	2.2 What are the factors that influence community members' access to communication media in print, broadcast and electronic	2.2.1 Socio-ecomic factors for choice of different communication media	2.2.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques)	2.2.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16 2.2.1 Computer-Assisted

	formats in the rural community?		2.2.1 Focus Group Discussions involving community members (5-7 members per FGD)	Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
		2.2.2 Costs related to acquisition of communication media	2.2.2 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 2.2.2 Focus Group Discussions involving community members (5-7 members per FGD)	2.2.2 Descriptive Analysis (frequencies and percentages) using SPSS version 16 2.2.2 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
		2.2.3 Location of the community	2.2.3 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 2.2.3 Focus Group Discussions involving community members (5-7 members per FGD)	2.2.3 Descriptive Analysis (frequencies and percentages) using SPSS version 16 2.2.3 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
	2.3 To what extent do socio-economic factors influence community members' preference for communication in rural communities?	2.3.1 Direct influence of respondents' socio-ecomic factors (age, gender, income, asset ownership, marital status, type of farming enterprise the community members involved in) to preference choice of for different communication media	2.3.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 2.3.1 Focus Group Discussions involving community members (5-7 members per FGD)	2.3.1 Multi-nomial Logistic Regression Model 2.3.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
3. To examine the influence of media content on enhancing rural community members' preferences for communication media.	3.1To what extent are the available print media in the rural communities readable?	3.1.1 Readability of print media in the study area	3.1.1 Examination of available print media	3.1.1 Flesch Reading Ease Formula 3.1.1Flesch Index table for interpretation
	3.2 What are the factors that influence media content for the acceptability of communication media in the rural community?	3.2.1 Type of agricultural information on communication media	3.2.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 3.2.1 Focus Group Discussions involving community members (5-7 members per FGD)	3.2.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16 3.2.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)
		3.2.2 Language use on communication media	3.2.2 Examination of available communication media	3.2.2 Document Textual Analysis-Critical Discourse Analysis (CDA)
		3.2.3 Clarity of messages on communication media	3.2.3 Examination of available communication media	3.2.3 Document Textual Analysis-Critical

				Discourse Analysis (CDA)
	3.3 How does content of communication media influence preferences for communication media by men, women and youth in rural communities?	3.3.1 Relationship between media content and community members (men, women and youth) preferences for print, broadcast and electronic communication media	3.3.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques)	3.3.1 Descriptive Analysis (frequencies and percentages) using SPSS version 16
4. To examine the utilisability of communication media in print, broadcast and electronic formats in rural communities.	4.1 What are the major constraints that influence community members' access, utilisation and preferences for communication media in form of print, broadcast and electronic in rural communities?	4.1.1 Major constraints	4.1.1 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques)	4.1.1 Exploratory Factor Analysis
		4.1.2 Extent of constraints in constraining utilization of print, broadcast and electronic communication media in rural communities	4.1.2 Semi-structured questionnaire survey (240 respondents selected using using proportionate and random sampling techniques) 4.1.2 Focus Group Discussions involving community members (5-7 members per FGD) 4.1.2 Key Informant Interview (KII) using a checklist of questions(with 7 extension officers, 3 researchers, 2 breeders, 5 information providers)	4.1.2 Exploratory Factor Analysis 4.1.2 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo) 4.1.2 Comparisons of the factors
	4.2 How does perception influence utilisation and preferences for communication media in form of print, broadcast and electronic in rural communities?	4.2.1 Perception on style of information presentation on the communication media	4.2.1 Key Informant Interview (KII) using a checklist of questions(with 7 extension officers, 3 researchers, 2 breeders, 5 information providers) 4.2.1 Literature reviews	4.2.1 Computer-Assisted Qualitative Data Analysis Software (CAQDAS), NUD*IST Vivo (NVivo)

Appendix 15: Estimated results of multi-nomial logistic regression model (Radio is the reference choice category)

Variables	Booklet				Leaflets				Videotapes/DVD				Internet				Television				Mobile phones			
	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)	Co-efficient (β)	Significance	Standard error	Odd ratios(E(β)	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)	Co-efficient (β)	Standard error	Significance	Odd ratios(E(β)
Intercept	-92.040	0.687	0.984	-	-11.618	0.360	0.000	-	34.028	0.990	2.860	-	-78.770	1.151	0.995	-	3.028	2.229	0.054	-	22.144	0.126	0.996	-
AGE	0.480	1.04	1.00	1.617	0.481	1.10	0.661 ns	-1.677	-0.331	0.994	1.30	0.718	12..358	0.55	0.996	2.328	11.839	0.97	0.984 ns	1.386	-1.558	0.69	0.998	0.210
GENDER	16.701	1.46	0.990	1.791	-0.485	1.72	0.777 ns	-3.849	-11.356	0.994	1.36	7.364	7.167	1.12	0.998	1.295	-11.516	0.99	0.990 ns	6.789	5.349	1.13	0.997	80.703
ELCM-PE	11.111	1.18	0.972	3.437	16.051**	1.26	0.000	13.582	-0.641	0.527	0.69	0.527	13.886	0.90	.992	1.073	10.903	1.28	.973 ns	5.432	11.131	0.51	0.979	6.249
ELCM-SE	11.481	1.49	0.971	7.761	18.908**	1.96	0.000	15.068	-1.045	0.352	0.66	0.594	-17.506	0.57	0.995	6.206	11.627	1.39	0.971 ns	1.121	11.481	0.73	0.971	9.030
ASS	-1.465	1.44	0.249	-2.942	-1.465	0.63	0.249 ns	11.870	-.118	0.935	0.58	-3.957	1.443	0.60	0.468	-2.451	0.499	0.63	0.775 ns	-2.926	-0.441	0.59	0.630	-2.654
MS	10.752	0.83	0.970	4.674	0.939	1.19	0.430 ns	-1.393	12.270	0.966	0.53	7.364	2.314	0.53	0.998	10.118	10.604	0.79	0.970 ns	6.705	11.417	0.56	0.968	2.836
INCOME	-2.03e-07	1.27	0.386	-6.62e-07	3.19e-08	1.49	0.645 ns	-1.04e-07	3.19e-08	0.645	0.70	-6.62e-07	-2.03e-07	0.55	0.386	-6.62e-07	2.13e-07	0.57*	0.003	7.08e-08	3.55e-08	0.77	0.696	-1.43e-07
TFE	-1.043	1.07	0.295	0.352	-0.509	0.72	0.477 ns	-1.912	-0.253	0.789	0.53	0.777	10.237	0.90	0942	2.792	-0.524	0.59	0.592 ns	1.637	-0.244	0.57	0.695	0784

Number of observations=240 ; Degree of freedom (df) =42**;** Adjusted R-squared: Nagelkerke R.Square =0.360; Cox and Snell R.Square=0.340; McFadden R.Square=0.142 ;

Statistical significance: * statistically significant at p≤0.01 level; ns not statistically significant at p≤0.05. **Key: AGE**= Age of community member in farming; GENDER= Gender of community member; ELCM= Educational level of community member; ELCM-**PE**: Educational level of community member, primary education; ELCM-**SE**: Educational level of community member, secondary education; ASS= Asset ownership; MS= Marital status; **INCOME**= Income of community member; TFE= Type of farming enterprise community member involved in