AGRICULTURAL INFORMATION PERCEPTIONS AND BEHAVIORS OF SMALLHOLDER FARMERS IN THE CENTRAL REGION OF MALAWI

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Life is full of surprises and in most cases people do not get what they wanted or thought they deserved, but with determination, patience, faith in God as well as hope, people can meet their aspirations.

The most important thing is never to stop aspiring no matter how hard or difficult things may look: Never give up, keep faith alive, believe in God and yourself and you can achieve all for with God all things are possible.

However, there is only one secret to being successful — be around people who believe in you and are honest with you because they are the ones whom you need most when you are low or high.

No matter what you have gone through in life or what people have said to you, God's words are final. For He knows the plans He has (Jeremiah 29:11) and always remember though it tarries a vision will always come to pass. Wait for it and have faith in God (Habakkuk 2:3).

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DEFINITION OF TERMS

Accessibility of a media channel: The ease with which a communication channel can be used by a source or receiver. Accessibility encompasses the ease with which an individual or group can use a communication channel using locally available human, monetary and physical resources.

Agricultural communication officer: An individual employed by the Ministry of Agriculture and Food Security who is involved in development and dissemination of agricultural information to farmers and other target audiences.

Availability of a media channel: The degree to which a communication channel is available to a source or receiver at a given place or time without considering the resources that are required to use that channel.

Channel: A communication vehicle or means used to deliver a message to a receiver; mass media channels include newspaper, magazine, radio, television and other media (Rogers, 1974; Tucker & Napier, 2001; Dominick, 1999).

Communication: The process that involves the transfer of messages from a source to one or more receivers in order to change perceptions or behaviors of the receiver (Rogers, 1974).

Mass media: The mechanical and technological devices and the institutions that produce, store and transmit messages to large audiences (Dominick, 1999).

Perception: An idea, belief or awareness of a phenomenon that may or may not influence a behavior. Perceptions are influenced by an individual's personal interest, past experience, values, environment and personal preferences.

ABBREVIATIONS

ACB	Agricultural Communication Branch
ACOs	Agricultural Communication Officers
ADDs	Agricultural Development Divisions
DAES	Department of Agricultural Extension Services
DADOs	District Agricultural Development Offices
EPAs	Extension Planning Areas
MOAFS	Ministry of Agriculture and Food Security

ABSTRACT

Masambuka-Kanchewa, Fallys. M.S., Purdue University, May 2013. Agricultural Information Perceptions and Behaviors of Smallholder Farmers in the Central Region of Malawi. Major Professor: Mark A. Tucker.

Low levels of adoption of agricultural technologies are among the problems affecting agricultural development in most African countries, including Malawi. Research shows that limited access to information is one of the major factors affecting adoption of agricultural technologies. To ensure increased access to agricultural information, the Malawian government established the Agricultural Communication Branch (ACB) through the Department of Agricultural Extension of the Ministry of Agriculture and Food Security. The ACB is mandated to disseminate print and electronic agricultural messages to all farmers in the country. However, little is known regarding farmers' use of such communication media to access agricultural information because no established mechanisms exist for collecting audience feedback.

Regular audience feedback is important in improving delivery of agricultural information. Equipped with these data, communicators have a better understanding of audience needs and preferences and a more solid basis for targeting information to farmers. The current research was aimed at describing and understanding Malawian farmers' perceptions and use of communication channels for accessing agricultural information. The study was based on the following objectives: To identify communication channels used

by Malawian farmers when accessing agricultural information; to identify demographic factors associated with Malawian farmers' preferences for and use of communication channels; and to identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers. In-depth interviews were conducted with 20 farmers and survey research techniques were used to collect data from 12 ACB communication officers in support of study objectives.

Farmer data were collected using a question route developed by the researcher. Farmers were randomly selected from a list maintained by the Department of Agricultural Extension. The researcher visited farmers in their respective homes and administered the interviews in Chichewa, Malawi's vernacular language. Responses were then translated into English and transcribed. Communication officer data were collected using a semi-structured questionnaire that was mailed to participants. The researcher made follow-up phone calls to encourage completion and return of the questionnaires. Farmer data were entered into Microsoft Excel for analysis, in which the researcher tabulated frequencies and identified themes in the data. Communication officer data were entered into SPSS for descriptive analyses that included tabulation of frequencies and percentages.

Findings from this research showed that radio was most-used medium among the farmers who participated in the study. However, it was indicated that farmers prefer print media when accessing information despite observations that farmers in the study had never accessed information in print media. This finding demonstrated farmers' use of a communication channel does not necessarily indicate that farmers prefer that channel, but that in the absence of a preferred channel, will use whatever channel is available to them. Findings also revealed that most women who participated in the study do not have control

over the use of communication devices and, further, that some women would not participate in the study because their husbands were present at the time of data collection.

Findings also revealed that most communication officers participating in the study were not aware of the communication channels used by the farmers and also that the officers were not familiar with channels used by ACB. However, officers expressed the view that the ACB does not meet all farmers' information needs due to such challenges as inadequate financial resources, limited support from other players, inadequate skills, and mobility problems.

Findings from this research have the potential to improve delivery of agricultural information to Malawian farmers. Realizing this potential will require the consideration of recommendations pertaining to both communication officers and administrators in ACB and the Ministry of Agriculture and Food Security. Among the recommendations are to increase communication staffing levels to ensure adequate communication capacity in the organization. Also recommended is an organizational needs assessment to assist the Ministry of Agriculture and Food Security in identifying strategic priorities, resources and a timeline for establishing or restoring important organizational functions such as audience and impact analysis. Finally, it is recommended that research and evaluation capability be re-established within the ACB to allow ongoing audience analysis and collection of farmer feedback on which to base future agricultural communication efforts. Implications for future research are offered in the closing section of the document.

CHAPTER ONE: INTRODUCTION

Introduction

Malawi is one of the developing countries in Africa located in the sub-Saharan region of southeastern Africa. The country has a population of about 14 million (Government of Malawi [GoM], 2009) with females constituting 51% of the population (GoM, 2008). Malawi is the world's fifth poorest country with the majority of women and children constituting the poorest of the poor (Canadian International Development Agency report, 2013). Nearly 90% of people live in rural areas and are engaged in subsistence farming (GoM & World Bank, 2006). More than half (52.4%) of Malawians live below the poverty line (GoM, 2010).

In terms of geography, Malawi is a landlocked country bordered by Mozambique on the south and central region, Zambia on the north and west, and Tanzania on the north. Malawi occupies about 118,000 square kilometers with 61% of its land favorable for agriculture (Fatch, Mambo, & Lungu, 2010).

The country is divided into three administrative regions — Northern, Southern and Central — and a total of 28 districts. The city of Lilongwe, located in the Central Region, is Malawi's capital city and serves as the center for nearly all the country's administrative and government offices. The city of Blantyre is generally considered the country’s commercial capital.

Formerly a British colony, Malawi gained independence in 1964. From 1964 to 1992, Malawi was governed under a one-party system of government in which Dr. Hastings Kamuzu Banda served as president. Malawi became a democratic state in 1993 and elected Bakili Muluzi as its first democratic leader in 1994 who ruled for ten years. Muluzi's term ended in 2004 and saw the election of Bingu Wa Muntharika, who served as president until his death in 2012. Muntharika's vice president, Joyce Banda, assumed Malawian presidency upon his death (Posner, 1995).

Because agriculture is central to Malawi's economy, the country's development strategies and policy reforms concentrate heavily on this sector (Harrigan, 2003). Changes in political leadership often bring reforms in this sector and, as a result, Malawi's agricultural sector has undergone major changes from colonial rule to date. Much of the reform has targeted smallholder farmers as they constitute the largest percentage of farmers in the country and are faced with low productivity and limited access to inputs (Alwang & Siegel, 1999).

Malawi's Agriculture

Malawi has a subtropical climate generally with two seasons: a cool-dry season and a warm-wet season. The rainy season extends from November to April with an annual precipitation of 725 mm to 2,500 mm (Fatch et al., 2010).

As the backbone of Malawi’s economy, agriculture accounts for 90% of export earnings, contributing approximately 45% toward the gross domestic product (GDP) and employing about 90% of the population (GoM, 2010).

Malawi’s agriculture may be categorized into two sectors: a large-scale estate sub-sector and a small-scale sub-sector with a large percentage of crop production. The

smallholder sub-sector supplies about 85% of the country's food requirements and accounts for 80% of total agricultural output (Fatch et al., 2010). There are about 2 million smallholder farmers in Malawi with 70% of the farmers cultivating an average land area of 2.5 acres (Chirwa, 2007). Maize is the predominant crop produced by most smallholder farmers as it is used in making *nsima*, Malawi's staple food. While land sizes are relatively small, research shows that many Malawian smallholder farmers neglect their fields and farm activities while searching for employment and wages, which can lead to a continuing cycle of food insecurity and poverty (Alwang & Siegel, 1999).

Most smallholder farmers are involved in subsistence farming and mainly grow food crops such as maize, groundnuts, soybeans and common beans such as kidney beans. Some smallholder farmers also produce cash crops such as tobacco, cotton, chilies, coffee, soybeans, and sunflower (Kherallah, Minot, Kachule, Soule, & Berry, 2001).

The estate sub-sector trails the smallholder sub-sector in terms of employment, with tea and tobacco estates accounting for about 75% of the estate sub-sectoral employment (Gough, Gladwin, & Hildebrand, 2002). The estate sub-sector also produces substantial amounts of maize for commercial purposes.

Compared to crops, livestock constitute a relatively small sub-sector of Malawi’s agriculture. The livestock sector is typically a low-input/low-output management system with more than half of a million smallholder families (GoM, 2009). Higher outputs of livestock production are limited to a relatively small number of large-scale intensive commercial livestock/poultry enterprises, most of which are located in the urban and peri-urban areas of Blantyre, Lilongwe and Mzuzu cities. Intensive production enterprises include broiler and layer production, beef cattle feedlots, pig production, and dairy

production. These enterprises form the major outlets for protein sources in Malawi (Goyder & Mang'anya, 2009).

Fish production from aquaculture is estimated at 500 tons (Sikawa & Matiya, 2002). Small-scale farmers produce 80 tons, small water bodies 60 tons, and commercial fish farmers produce 30 tons representing only 0.07% of total fish production in the country (Sikawa & Matiya, 2002).

Malawian government agricultural programs

Due to the important role that agriculture plays in Malawi's economic development, the Malawian government through the Ministry of Agriculture and Food Security (MOAFS) coordinates the country's agricultural programs. The MOAFS implements activities through the following departments that are mandated to undertake activities to improve the country's agricultural production and enhance agricultural productivity: Department of Animal Health and Livestock Development, Department of Crop Development, Department of Land Resource Conservation, Department of Research Services, Department of Fisheries, and Department of Extension Services. Additional departments offer support services to all departments within the ministry, one of which is the Department of Planning Services.

Each department is responsible for coordinating and implementing programs and activities in accordance with mandates. The Department of Agricultural Extension Services (DAES) is mandated to provide extension services to enhance adoption of improved agricultural technologies for all gender categories and vulnerable groups. The department implements its activities through the following branches: Food and Nutrition, Agribusiness, Gender, Extension Methodologies, and Agricultural Communication

(ACB). Smallholder farmers are a primary target group for Extension services since they constitute a large proportion of all farmers and play a significant role in ensuring the country's food security.

To reach farmers effectively, the DAES department has staff at the grassroots level, including offices in all three regions of the country. In addition, the country is divided into eight agro-ecological zones and there are eight Agricultural Development Divisions (ADDs) located in these zones to oversee agricultural activities. The ADDs are regional agricultural offices that are divided according to the ecological zones and are headed by program managers who are responsible for overseeing activities in the surrounding districts. Each ADD serves approximately three or more districts. Apart from the program manager, each ADD has specialists from various departments and branches of DAES who are responsible for coordinating activities in various fields. In terms of communication, agricultural communication officers are responsible for overseeing communication activities at the ADD level.

The department also has staff in each district in what are known as District Agricultural Development Offices (DADOs). There are 28 DADOs located in almost every district in the country. District agricultural development officers, responsible for coordinating Extension activities in the district, head DADOs. In addition to housing various subject matter specialists, each DADO is supposed to have district agricultural communication officers (ACOs) who are responsible for coordinating communication activities in every district.

Each DADO is composed of Extension Planning Areas (EPAs) and headed by Agricultural Extension Development Coordinators. Each EPA is composed of several

sections, each section containing several villages. (A map of Malawi showing Extension Planning Areas is provided in Appendix A). Throughout Malawi there are 187 EPAs and 2,104 sections. The sections are headed by the agricultural Extension officer (change agents). Extension worker-to-farmer ratios range from 1:1,200 to 1:3,000 despite the fact that the recommended ratio is 1:500 (GoM, 2006).

In addition to staff, the DAES reaches and serves farmers through various media channels, including print and electronic messages produced by ACB. Established in the early 1970s, ACB was charged with developing and disseminating messages through print and electronic media to facilitate adoption of agricultural technologies and improve agricultural productivity in Malawi. Departments such as the Department of Research Services develop various agricultural technologies aimed at helping farmers increase productivity on their farms. They use professional communication services offered by ACB to create farmer awareness as well as encourage adoption of new technologies and recommended practices.

The ACB implements programs through Radio, Mobile Unit, Video, and Publication sections so that materials published or disseminated through one section are often adapted for transmission through other sections. The Radio section develops and disseminates radio messages alongside other sections to assist farmers in implementation of agricultural programs to achieve higher incomes and increase levels of food security. The Mobile Unit and Video sections collect video footage to produce various agricultural video films. These films are shown to farmers in villages using a specially equipped mobile van, popularly known as "*Ulimi Walero Van*" as a tool supporting agricultural field staff. The section also provides other media services to the ministry and various

organizations upon request. Examples of these services include provision of public address systems to official functions as well as maintenance of audio-visual equipment in the ministry. The section also carries out mobile van campaigns where agricultural staff delivers public announcements using the mobile van. Campaigns are utilized to bring awareness to farmers on disease outbreaks and other crucial messages that require attention.

The Publication section publishes agricultural messages to help staff and farmers access timely and relevant messages to improve agricultural productivity. The Publication section has three subsections: Editorial, Graphics and Print Shop. Among publications, the branch produces a local agricultural magazine known as *Za Achikumbi*, a bi-monthly publication that carries feature stories and other technical messages. The Publication section also has reporters at ACB headquarters and uses agriculture communication officers and DADOs from ADDs and districts to collect feature stories from farmers and field staff for production of booklets and magazines. Additionally, still photographs are used to help transmit information to farmers and field staff.

Particularly important in light of climate change is the adoption of improved technologies that lead to early-maturing and high-yielding crops (Mviha, 2007). Currently, Malawi's erratic rainfall patterns pose a significant challenge to smallholder farmers, who typically rely on rain-fed agricultural practices. To deal with this challenge, farmers need consistent access to agricultural information such as that provided by the ACB.

Challenges facing dissemination of agricultural information

While DAES personnel and programs have the goal of helping farmers increase incomes, food security and productivity, they are beset by challenges that hinder their ability to fulfill their mission. Low staffing at all levels is one major challenge faced by the department. With limited staff, Extension personnel struggle to provide farmers with timely and relevant messages on new technologies. Provision of advisory services is critical since low levels of adoption related to improved agricultural technologies poses a major threat to development of Malawi's agricultural sector (Banda, 2007; Mviha, 2007).

Additionally, many farmers are concentrated in rural areas under difficult living conditions including no electricity or running water, making accessibility a challange. Women constitute 70% of full-time farmers, perform 70% of agricultural work, and produce 80% of food for household consumption. However, most of the women are illiterate with literacy levels estimated at 44% (GoM, 2009). High levels of illiteracy are associated with lower levels of economic status and increased difficulties in accessing agricultural information. This situation seriously hinders agricultural development in Malawi because smallholder farmers constitute a high percentage of Malawian farmers.

Another challenge includes the lack of an evaluation system that could help target and improve delivery of needed agricultural information throughout the country. ACB formerly housed a monitoring and evaluation section responsible for conducting audience analysis to measure farmers' perceptions and use of communication channels used by the branch. As a part of this work, the section involved farmers in evaluating developed messages and channels used for dissemination. However, MOAFS abolished the section in the late 1990s (A. Chikomola, personal communication, 2011). The role of evaluating

messages and media was transferred to the Department of Planning Services in the Monitoring and Evaluation section. The department does not currently monitor or evaluate messages, as there is little or no communication expertise on its staff. Evaluation of developed messages appears not to be among priorities of the Planning section (A. Chikomola, personal communication, 2011), allowing for no systematic follow-up or evaluation of ACB messages.

Statement of Problem

The ACB uses several different communication channels to disseminate messages to farmers. Among these channels, print and radio are the most frequently used. However, little is known regarding farmers' access to and use of information through these channels. It is not known if messages disseminated via these channels address farmer needs as no established mechanism exists for obtaining farmer feedback regarding access to and use of communication channels. In Malawi, women constitute 70% of the smallholder farmers and it is reported that 56% of rural women are illiterate. It is not well understood whether or how illiterate audience members perceive or use information disseminated via print media. In addition, it is reported that low literacy levels are associated with low-income status, which denies women an opportunity to own or control household assets such as radios. Therefore, little is known regarding the effectiveness of these channels in disseminating information to women farmers in particular.

While the paucity of audience research in Malawi presents a challenge to improving delivery of agricultural information, it is important to recognize that the audience is but one component of the communication process. As described in the classic SMCR (Source Message Channel Receiver) model of communication (Wilson & Wilson,

2001), the communication process involves a source that transmits a message via a channel to a receiver. This model has been applied in both interpersonal and mass communication contexts. Although there may often be a tendency to conceptualize the communication process by first thinking about the receiver or audience, consideration of the source is equally important if the goal is to improve the information delivery process. Within this communication model, sources and receivers may be individuals, groups or organizations, and each may know very much or very little about the individuals, groups or organizations with which they wish to communicate (Dominick, 1999).

Significance of Study

Understanding farmers' information-seeking needs and their preferred channels for receiving information is important in helping communication professionals improve effective delivery of agricultural messages (Ford & Babb, 1989). This understanding enables communicators to identify farmers' information needs as well as preferred methods of receiving this information, thereby ensuring farmers reception of needed information in an accessible format (Suvedi, Campo, & Lapinski, 1999). Proper understanding of audience needs is important because of variations that exist among farmers regarding use of and preferences for communication channels. Such variations include accessibility, control over medium use, and perceived relevance of information delivered, in addition to demographic factors such as gender, education level, income and farm size (Suvedi et al., 1999; Hunt & Ruben 1993).

This study is significant because it assists in advancing understanding of the role of communication in ensuring Malawi’s continued agricultural development. This study explores audience use and perceptions related to various communication channels

available to Malawian farmers, enabling communicators to improve successful information delivery.

Importance of audience analysis in message development and dissemination

Audience analysis plays a crucial role in selecting a communication channel for disseminating agricultural information (Bouare & Bowen, 1990; Radhakrishna, Nelson, Franklin, & Kessler, 2003; Richardson & Mustian, 1994; Riesenberg & Gor, 1989; Rollins, 1993). Data derived through audience analysis enables communicators to anticipate receiver's frame of reference (Leeuwis, 2004) and ensure that farmers receive information they need (Suvedi et al., 1999).

Information sources, which may be individuals or organizations using either interpersonal or mass communication channels, form a critical link in the communication chain. Sources perform a complex task referred to as *encoding* when they translate and prepare a message for transmission through a channel to an audience (Dominick, 1999). Essential in this process is the importance of visualizing and anticipating needs of audience members, which, besides needs includes: resources, abilities and motivations.

Farm magazines, newsletters, radio and television are some of the most frequently used communication channels for delivering agricultural information to farmers (Yahiya & Badiru, 2002; Korsching, Lasley, & Gruber, 2005). Despite high levels of illiteracy and the low economic status of many Malawian farmers ACB uses magazines, posters, leaflets, puppet shows and radio (GoM, 2010) to deliver agricultural information. Results from a USAID-sponsored project conducted in Malawi in 1987-1991 revealed that messages developed by the branch were not wholly relevant as they lacked information needed by farmers (Sturges & Chinseu, 1996). Riesenberg and Gor (1989) indicate that

communicators' choices of communication channels may sometimes be based on their own personal preferences rather than audience needs.

Considering each communication channel has advantages and disadvantages and can be useful in different ways, it is important for communicators to understand audience needs so that appropriate communication channels can be selected and used (Omosa, 1999). For example, print media offer an advantage in providing technical information, especially for information that addresses infrequently used practices and those that are difficult to remember (Garforth, 2005), but one must be able to read. Conversely, radio can reach a wide audience from a central point within a short period of time, but audiences must have access to the medium and the ability to tune in at specific times to receive this information (Omosa, 1999).

The role of communication in ensuring Malawi's agricultural development

Communication is important in ensuring transfer of information. Mass media is an important form of communication to ensuring appropriate delivery of information to farmers. Mass media technologies like radio can make such communication possible by reaching a wide audience from a central point within in a specific time frame (Omosa, 1999).

Additionally, mass media has been shown to be important in the adoption of innovation decision processes as they help to change weakly held attitudes through knowledge creation and distribution of information (Escalada, Heong, Huan, & Mai, 1999). Insufficient communication of information regarding innovations to potential users has been identified as one cause for low levels of adoption of technologies (Massango & Miles, 2004). Radio and print media reach a large potential audience and

can help accelerate message transfer. Their use has potential to address one major challenge facing Malawian farmers, limited access to technical messages due to low Extension worker-to-farmer ratio (Rogers, 1974; Yahiya & Badiru, 2002). However, adoption of new agricultural technologies can be improved only if information is delivered through methods suitable for farmers with low literacy levels (Massango & Miles, 2004). This highlights the importance of appropriate methods being utilized by communicators when delivering agricultural information.

Purpose and Objectives

The purpose of the study was to describe Malawian farmers' perceptions and use of communication channels for accessing agricultural information. This understanding will enable communicators to provide information using channels that are accessible to, and preferred by, farmers. The following are specific objectives of the study:

- Identify communication channels used by Malawian farmers when accessing agricultural information.
- Identify demographic factors associated with Malawian farmers' preferences for and use of communication channels.
- Identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers.

Limitations of the Study

As is typical in social science research, the current study has limitations that should be considered in interpreting and applying results and recommendations provided in subsequent chapters. First, due to researcher's professional background and training as an agricultural communicator, there is a threat of bias in questions asked: the manner in which questions were asked and the manner in which results were interpreted. To address

these threats researcher adhered to a research protocol designed to minimize the threat of personal bias.

Second, it is possible that subjects recruited to participate in this research may be attitudinally or otherwise significantly different from their peers in the study population. To minimize this threat, the researcher selected subjects from a district considered to be representative of other districts. In addition, the researcher generalizes results from this research only to subjects, not to the entire population.

Third, the researcher relied heavily on studies and research conducted in other countries in the review of literature. It should be noted that, leading up to this study, relatively little agricultural communication channel research was conducted in Malawi. The researcher acknowledges there may be differences in how farmers use media channels and agricultural information in Malawi as compared to other countries and that this information may not be adequately captured in the review of literature review.

CHAPTER 2: REVIEW OF LITERATURE

Purpose and Objectives

The purpose of the study was to understand and describe Malawian farmers' perceptions and use of communication channels for accessing agricultural information. This understanding will enable communicators to provide information using channels that are accessible to, and preferred by, farmers. The following are specific objectives of the study:

- Identify communication channels used by Malawian farmers when accessing agricultural information.
- Identify demographic factors associated with Malawian farmers' preferences for and use of communication channels.
- Identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers.

To meet these study objectives, the researcher sought a theoretical perspective to help identify, measure and investigate relevant concepts from the professional and peer-reviewed literature. Ultimately, a theoretical perspective was developed utilizing a combination of tenets from diffusion of innovations theory and uses and gratifications theory. The following section discusses steps taken to review and identify key study concepts in the literature.

Literature Review Methodology

In the early stages of the literature review process, the researcher performed searches and reviewed textbooks and publications on agricultural communication in Malawi, Africa and worldwide. Due to a scarcity of literature on Malawian agricultural communication, the researcher concentrated on literature from Africa and the USA. The researcher relied heavily on literature from the USA as it was readily available. Literature from other African countries was then reviewed to ascertain whether findings and recommendations of USA authors could be applied in Africa. The researcher worked from the assumption that similarities existing in African culture and agriculture would permit findings from other African countries to be applied to Malawi.

In carrying out the literature search, the researcher used Google Scholar as the primary search engine. The following keywords, including various forms of each word, were used in the initial search: agricultural communication, channels, Malawian agriculture, radio, print media, disseminating agricultural information, and agricultural development. When relevant publications were discovered, reference lists were examined for additional works.

The following sections provide background on the major mass media channels used in Malawi to disseminate agricultural information, followed by an introduction to the theoretical perspective used to guide the study and a review and interpretation of relevant literature. In the course of the literature review, connections were made to the theoretical perspective as appropriate.

Agricultural Communication Channels in Malawi

Various communication channels exist to carry messages from sources to receivers. Mass communication occurs when organizations utilize technology to produce and transmit messages to large, heterogeneous audiences (Dominick, 1999). Mass media includes technological devices used to produce and transmit messages as well as the organizations or institutions that transmit these messages. The communication components used in mass communication are known as mass media and include newspapers, magazine, film, leaflets, radio and television (Rogers, 1974). In Malawi, radio and print media are the most frequently used mass media channels for delivering information followed by television and internet. The ACB mainly uses radio and print media when disseminating messages to farmers. The branch also uses television in special cases but does not use internet, and as of this date does not have a web site.

The Agricultural Communication Branch report of 2009 indicated that print and radio seem to be the most frequently used channels by the ACB in disseminating agricultural messages. Leaflets and *Za Achikumbi* magazine appear to be the most frequently used print media. However, Sturges and Chinseu (1996) reported that according to the results of a USAID-sponsored project conducted in the country in 1987-1991, messages developed by the branch were not wholly relevant as they lacked pertinent information. The findings did not indicate as to whose perspective this was or through which channels the problem was prevalent.

Radio medium

Radio is frequently used when disseminating agricultural information in Malawi. Most farmers consider radio as their prime source for agricultural information followed

by Extension workers (Farm Radio Malawi, 2011). According to the Department of Agricultural Extension Service's annual report for 2009/2010, as of August 2010, the ACB had produced and aired 570 radio programs in this two-year period. However, this figure may include multiple airings of the same programs. Radio programs, typically 20 to 30 minutes in duration, were aired on the nation's state owned radio, Malawi Broadcasting Corporation (MBC Radio One), and on Zodiak, a privately owned radio station. Despite having at least 10 radio stations in the country, ACB mainly uses MBC Radio One and Zodiac due to budget limitations and the belief that most people commonly use these stations.

In addition, agricultural communicators from various districts in the country also work in collaboration with other non-governmental organizations to produce and air radio programs on community radio stations in the various communities. Other non-governmental organizations focus on the use of radio in disseminating agricultural information an example being Farm Voice Radio. It was reported that 58% of Malawian farmers own radios and that 56% of radio sets are owned and controlled by men (Farm Radio Malawi, 2011). To increase listenership of those programs by farmers of all genders, ACB often works with non-governmental organizations to encourage the formation of radio listening groups that enable farmer-listeners to share one radio. The radio listening groups are beneficial because farmers can contribute money for purchasing batteries for the radio, making access to radio easier for the poor. However, a challenge remains in getting farmers to one location so that they can listen to the programs.

Print medium

Print media channels used by the ACB include leaflets, posters and magazines. Leaflets are usually one page long and printed in color or black only, depending on availability of funds (Chowa, 2010). Illustrations and photographs are often used to enhance comprehension of intended message. Posters typically rely more on illustrations than text to enhance message understanding for illiterate farmers. In most cases, a poster has a maximum of 20 words. Posters are usually used when bringing awareness to the farmers or when promoting specific technologies. Posters are printed in color unless there are limited funds (Chowa, 2011).

Leaflets and posters are often used to disseminate information about current issues pressing farmers, current information regarding new technologies, and production information appropriate for the farming season. Such information often comes from the department of research as well as others. The frequency of messages depends fluctuates with needs (J. C. Nkhoma, personal communication, 2011).

On the other hand, *Za Achikumbi* magazine is produced bi-monthly and carries both feature and news articles written by communication officers from districts, ADDS and ACB headquarters.

The posters, leaflets and *Za Achikumbi* magazines are distributed in every district in the EPAs. Agricultural Development Coordinators distribute the materials to Agricultural Development Officers, who then distribute them to farmers in the different sections (J. C. Nkhoma, personal communication, 2011).

The DAES report for 2010 indicated that ACB produced a total of 10 technical messages. Most of these messages carried information on crop production. In addition,

the Branch produced and distributed 142,100 *Za Achikumbi* magazines and 159,040 leaflets.

Various other agricultural organizations disseminate print media messages to farmers. However, there are variations in the design of the posters used by ACB and other organizations. The posters used by ACB usually contain photographs while other organizations include illustrations.

Apart from radio and print media channels, ACB also uses television, puppet shows and awareness campaigns. The ACB has mobile vans in almost all ADDs, to be used when displaying puppet shows and during campaigns. In 2009-2010, the Branch developed nine puppet play messages and carried out 47 awareness campaigns. Campaigns are usually to deliver crucial and urgent information addressing things like pest or disease outbreaks, or reminders to farmers concerning different agricultural activities. Puppet shows are used to complement media message like radio and print by emphasizing certain important points. Puppet shows, usually 30 minutes in duration, are sometimes used as crowd pullers to increase an audience, because they provide a sort of entertainment (Kapindu, 2011).

Theoretical Framework

Low levels of adoption for new technologies constitute one major challenge affecting agricultural improvement in developing countries. A major reason for low levels of adoption is insufficient communication regarding these technologies (Massango & Miles, 2004). This continues to be the case despite efforts by governments to ensure farmers have access to relevant information. In Malawi, the government established the

Agricultural Communication Branch to help ensure farmers' access to needed information.

Limited access to agricultural information, especially on improved practices and technologies, poses a significant challenge to Malawian smallholder farmers. Lack of information is significant problem because this communication can reduce uncertainty regarding a new technology. Hence, access to information is critical in farmers' innovation adoption decision-making (Adolwa et al., 2012). However, most adoption research focuses on characteristics of new technologies promoted rather than communication medium used to facilitate adoption (Moussa et al., 2011). The lack of communication research in Malawi presents a challenge to those seeking to better understand channels where farmers receive information, in turn influencing decisions to adopt or reject an innovation.

It was noted earlier that one of the contributing factors to insufficient communication on improved technologies are the assumptions that professional communicators may make during and about the information delivery process. According to Reisenberg and Gor (1989), some professional communicators may choose to utilize particular communication channels based on their personal preferences rather than on audience needs. In the current case, this situation could affect accessibility to and availability of information to farmers. Farm magazines, newsletters, radio and television have been the most frequently used communication channels for delivering agricultural information to farmers, although newer electronic channels are being widely adopted by farmers in developed counties (Yahiya & Badiru, 2002; Korsching et al., 2005; Boone, Meisenbach, & Tucker, 2000). Print media and radio are frequently used channels by the

Agricultural Communications Branch in disseminating agricultural messages (GoM, 2010). Communication channels may sometimes be selected and used by professional communicators without fully considering the variations that exist among farmers regarding accessibility, control, and perceived relevance of information being delivered as well as demographic factors such as gender, education level, income and farm size (Suvedi et al., 1999; Hunt & Ruben 1993).

Current research seeks to identify factors that affect farmers' preferences for and use of communication channels, and that these factors are influenced by choices made by professional communicators (who may often choose which channels they will use in information delivery) as well as farmers (who may choose what channels they may use to receive information). To address these needs, a theoretical perspective is developed from components of the diffusion of innovations and uses and gratifications theories. Contributions of each of these theoretical perspectives are described in the following sections.

Diffusion of innovations theoretical perspective

The diffusion of innovations paradigm (Rogers, 1995) provides insights into the decision-making process used by farmers as well as professional communicators. This theoretical approach advances the notion that individuals' decision-making is influenced by a number of factors associated with the innovation, including relative advantage, social prestige, convenience, satisfaction, and compatibility with existing values.

Innovations that offer these characteristics are likely to be viewed more favorably by individuals than innovations that do not. The communication process figures prominently in the diffusion of innovations perspective. Farmers rely on communication,

including mass communication, to gain information on new innovations. They seek information based on a perceived need for information, yet they are constrained in their choice of communication channels to those that are available to them. For example, an individual may perceive a need for information on a particular agricultural technology and desire information via print media. However, the communication process cannot be fulfilled if the individual does not have access to that medium.

In addition, the diffusion of innovations theoretical perspective asserts that individuals form perceptions of various communication channels based on their perceived usefulness and relevance. Channels viewed as carrying relevant information in a form that is credible and understandable are likely to be viewed favorably, whereas channels viewed as less relevant or credible are likely to be viewed less favorably as a source of information.

The diffusion of innovations perspective provides insights into professional communicators' decision-making processes, as well. In the current research, it is asserted that decisions to use various channels for communicating with farmers are based on communicators' perceptions of how farmers use and view those channels. Communication channels considered to be accessible to and widely used by farmers will be viewed as having more utility than those that are thought to be inaccessible or not widely used by farmers.

Uses and gratifications theoretical perspective

The theoretical perspective employed in this research also draws from uses and gratifications theory. As described by Ruggiero (2000), uses and gratifications theory focuses on the relationship between the perceived satisfaction that a communication

medium offers to an individual and use of that medium. The theorist asserts that individuals prefer and use different communication channels based on their social and psychological needs and the degree to which a medium satisfies those needs. From the uses and gratifications theoretical standpoint, members of an audience are not passive receivers of messages, but active communicators whose behaviors are influenced by a range of different psychological and social factors in their respective environments (Rubin, 2009).

As applied in the current research, uses and gratifications theory asserts that farmers actively make decisions about the communication channels they will use to satisfy their information needs. Further, the relationships they build with communication channels are based not strictly on their "agricultural information" utility, but also on the ability of the channel or the communication experience to satisfy a wide range of potential needs and interests, such as entertainment.

Conceptual Framework

The conceptual framework for this study was developed from elements of diffusion of innovations and uses and gratifications theories. The dependent variable in this research is the selection of communication channels used by Malawian farmers; antecedent variables are farmers' perceived information needs, farmers' perceptions of a communication channel, and farmer access to the communication channel.

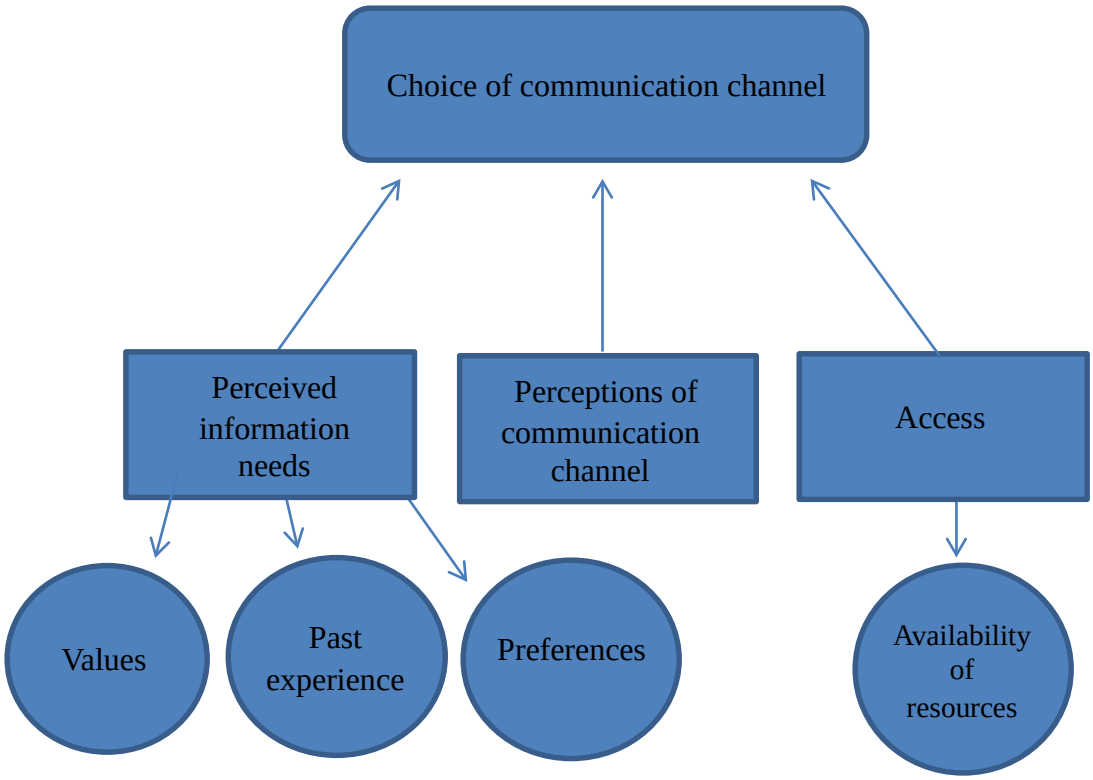

Figure 1 Conceptual Framework

Choice of communication channel

Farmers' use of communication channels may vary over time depending on accessibility of the channel and convenience. For example, farmers may prefer using radio when performing certain activities such as planting or harvesting as they spend a lot of hours in the field and may not have time to read or watch television (Licht & Martin, 2006). Radio is a medium that can be used even while individuals are performing other tasks. In other cases, farmers may prefer print media because they can attend to the information at their convenience and then file or otherwise keep the information for future reference if they desire to do so (Boone & Zenger, 2001). Given the

communication channel choices available to farmers, it is prudent for communicators to use a combination of communication channels to addresses farmers' information needs.

This research is also concerned with the communication channels selected by sources to disseminate information to receivers. Riesenberg and Gor (1989) indicate that communicators may sometimes choose to disseminate information over communication channels based on their own personal preferences rather than audience needs. Communicators may use channels that are convenient to them in terms of accessibility and focus on those that best suit their preferences and resources (Licht & Martin 2006). Research shows that farm magazines, newsletters, radio and television are among the most frequently used communication channels for delivering agricultural information to farmers (Yahiya & Badiru, 2002; Korsching et al., 2005). However, like communicators, farmers also have a choice regarding their selection of communication channels. Several factors have been found to affect farmers' choice of communication channels, including accessibility to the channel, control of the channel, perceived relevance of the information being delivered as well as demographic factors such as gender, education level, income and farm size (Suvedi et al., 1999; Hunt & Ruben 1993).

Professional communication practice would generally require that communicators prioritize farmers' information needs over their own personal preferences to maximize effective communication and to ensure that resources are put to good use. A primary concern to be considered by communicators is whether a channel can be easily accessed by the farmers, is trusted and valued, and is preferred by farmers to address their information needs. It is also important that communicators understand the purpose for

delivering information so that they choose appropriate channels for delivering information, as not every channel serves the same purpose.

Table 1 displays various communication strategies for innovations and their characteristics which could be useful to communicators when selecting a communication channel to address farmers' information needs.

Table 1

Communication for Innovation Strategies and their Characteristics

Strategy/ Service	Intervention goal	Role of communication	Role of client (s)	Key process(es) involved	Basis of legitimation
Focus on individual change/farm management communication					
Advisory communication	Problem solving Enhancing problem solving ability	Consultant counselor	Active problem owner	Problem solving counseling	Active demand
Supporting horizontal knowledge exchange	Knowledge exchange Diffusion of innovations	Source of experience Facilitator	Active listeners Sources of experience	Learning Networking problem solving	Active demand Public interest Limited resources
Focus on collective change/ coordinated action					
Generating (policy and/ or technological) innovations	Building coherent innovations	Facilitator Resource person Supporting vertical knowledge exchange	Active participants	Problem solving Social learning Network building Negotiation	Societal problem solving Ensuring progress Qualities of interactive mode of working
Focus on individual or collective change					
Persuasive transfer of (policy and /or technological) innovations	Realization of given policy objectives Predefined behavior change	Social engineer	Unexpecting receiver (initially)	Adoption Acceptance	(democratic) policy decision Preceding interactive process

Adapted from Leeuwis (2004).

Table 1 demonstrates the importance of communicators selecting communication channels based on the purpose of the message being delivered. Different media are best suited to delivering specific types of information and, as such, they meet different needs. Therefore, in the context of the current study, communicators need to understand farmers' information-seeking behaviors and consider the intended purpose of the message to be delivered before they select a channel for delivering the information (Suvedi et al., 1999).

Farmers' perceptions of media channels

Farmers' perceptions play an important role in determining their use of various media channels. Personal values, past experiences and preferences are some of the most important factors influencing farmers' perceptions of a specific communication channel. Especially important is the concept of trust and it has been consistently demonstrated that farmers prefer to use channels they trust (Boone & Zenger, 2001). Some farmers trust print media compared to other sources and, as such, they are more likely to prefer information from print media over information from other sources.

In addition, past experience with a given communication channel influences farmers' perceptions and use of the channel. Positive experiences with a specific media channel could lead to satisfaction and encourage future use of the channel, while a negative experience may discourage continued use. Such experiences have the potential to affect individuals' perceptions and, in turn, their behaviors. Therefore, farmers' perceptions play an important role in their choice of media channels. Understanding the factors that influence audience perceptions of media is important in the current context because of the role that communication media play in agricultural development. Mass media have been shown to be important in the innovation decision process as they can

help change weakly held attitudes through knowledge creation and dissemination of information (Escalada et al., 1999) as well as reinforce information received through interpersonal communication channels (Lowery & DeFleur, 1995).

Farmers' information needs

Better understanding of farmers' information needs is important in ensuring effective communication (Suvedi et al., 1999; Hunt & Ruben 1993). Effective delivery of agricultural information requires communicators to keep in mind farmers' information needs, which vary among farmers depending on size of the farm and other socioeconomic factors (Suvedi et al., 1999; Yahaya & Badiru, 2002).

Farmers' selection of media for specific information is based on different informational needs. Farmers respond positively to media channels that carry information that addresses their needs (Licht & Martin, 2006). For example, in many developing countries, farmers have been known to respond positively to media that provide entertainment (Rogers & Adhikarya, 1979). Insights such as this can be lost, however, if communicators do not assess farmers' information needs and preferences.

Accessibility of communication channels

Access to timely and relevant information is important as it influences people's decision making and actions (Omosa, 1999). In the innovation-decision context, communication is aimed at transferring information from the source to the receiver to encourage adoption of an innovation or some other perceptual or behavioral change in the recipient (Rogers, 2003). Mass media such as newspapers and magazines are among the traditional communication methods used to disseminate detailed information to farmers with the aim of ensuring positive behavioral change. This process can occur only if

farmers are able to physically access such media at convenient times (Awa, 1982**)**. Access to media is a challenge in most developing countries as much of the population has limited access to mass media as compared to developed countries (Rodgers, 1974). Factors contributing to limited mass media access in developing countries include low literacy levels, which hampers farmer use of information provided via print media. Low economic status can make it difficult for farmers to access information disseminated via radio as they may not be able to afford a radio set or batteries where there is no electricity. Most farmers in developing countries live below the poverty line (Rodgers, 1995; Yahaya & Badiru, 2002). In addition, inconvenient timing of radio messages and untimely or limited delivery of information provided via print media can make it difficult for farmers to access needed agricultural information disseminated through mass media (Sturges & Chinseu, 1996).

The role of communication in technology adoption

Human beings use various devices such as words and language, pictures, drawings and music to convey meaning and communicate with others (Leeuwis, 2004). Communication involves transfer of messages from a source to one or more receivers in order to change the behavior of the receiver (Rogers, 1974). There are various channels of communication that are used to carry the messages from the source to the receiver, including mass media. Among others, mass media includes newspapers, magazines, film, leaflets, radio and television (Rogers, 1974; Dominick, 1999).

Importance of radio in disseminating agricultural information.

Radio is defined as the medium of the mind, containing visual stimulation that can assist individuals in expanding their knowledge about a topic (Calvert, 1996). Radio has

been described as the most highly used medium for audiences accessing development and agricultural information (Munyua, Adera, & Jensen, 2009). Radio is also considered one of the most important tools in improving small-scale agriculture in rural areas (Munyua et al., 2009). Radio messages can reach a wide audience within a short period of time and are less expensive to use than other media (Awa, 1976). Radio is an effective medium for creating awareness and interest about an innovation (Calvert, 1996) and is considered a relatively inexpensive method for disseminating messages to farmers (Yahaya & Badiru, 2002).

A study conducted in Malawi by Sturges and Chinseu (1996) indicated that radio was the most frequently used communication channel. The researchers identified several problems affecting farmers' use of radio, including poor coordination between radio messages and extension agents' messages, failure of radio messages to address farmers' needs, and ill timing of programs. Untimely delivery and limited distribution of *Za Achikumbi* magazine was also reported as a problem, while puppet shows were reported to be infrequent and not a helpful source of information, although farmers considered them a source of entertainment. Hunt and Ruben (1993) indicated that radio involvement depends on the time of day, programming and listeners' interests. A limitation of radio is that it requires farmers to be present at specific times receive agricultural messages (Omosa, 1999). The low economic status of farmers in developing countries presents a challenge to the use of radio as farmers may not be able to purchase or maintain a radio set. In addition, there is no permanent record of information received from radio so farmers may not be able to recall this information when they need it.

Role of print media in disseminating agricultural information

Print channels of information are the oldest mass communication media that have been used in disseminating agricultural messages (Boone et al., 2000). Print media — books posters, leaflets, magazine, flyers and brochures — offer the advantage of providing a permanent record of information that users can access repeatedly and at their convenience. Boone and Zenger (2001) reported that print media are among the most trusted sources of mass media. Boone et al. (2000) reported that books were the earliest printed medium dating back to the 1400s. Garforth (2005) reported that print media are specifically suited to providing technical messages, especially those that include information on practices that are infrequently practiced and difficult to remember.

Print media offer the advantage of being accessible to farmers at their convenience and their ability to be stored as reference material. However, high levels of illiteracy pose a challenge as to how the farmers can make use of this medium.

Farmers' use of communication channels

A number of studies aimed at understanding farmers' information use of communication channels have been conducted in the U.S. and other countries. However, limited research has been conducted in Malawi aimed at assessing farmers' use of communication channels. One study conducted in Malawi assessed farmers' use of communication channels through focus group discussions (Sturges & Chinseu, 1996). However, researchers did not explore why farmers frequently used radio or why they valued and trusted information from *Za Achikumbi* magazine. At the time of the study in 1996, top-down Extension approaches were used for delivering agricultural extension messages. The government of Malawi started the pluralistic demand-driven provision of

agricultural extension services in 2001. As such, bottom-up approaches have been implemented from 2001 to date. In addition, this study was conducted in 1996 two years after Malawi became a democratic country. Therefore, the number of radio stations and agricultural programs may be different to date and this may have a bearing on the number of agricultural programs produced and aired.

The findings support those of Licht and Martin (2006), who studied the agricultural information preferences of corn and soybean producers in Iowa and implications for Agricultural Extension. Purposive sampling was used to select producers who participated in five focus group discussions throughout the state. The researchers found that producers use a variety of communication channels to receive agricultural information. Radio was shown to be one of the primary channels used. However, the study did not assess the types of messages accessed or the relationship between channel use and socioeconomic status.

Tucker and Napier (2001) studied the perceptual and farm structure factors influencing choice of information for decision making in three Midwestern U.S. states. A structured questionnaire and a drop-off/pick-up-later technique were used to collect data from 1,011 farm operators. Descriptive and multivariate statistics were used to analyze the data. Results showed variations in farmers' information-use patterns and perceptions. However, the study methodology did not address whether farmers' economic and social status influenced choice of communication channels.

CHAPTER 3: METHODOLOGY

Purpose and Objectives

The purpose of the study was to describe and better understand Malawian farmers' perceptions and use of communication channels for accessing agricultural information. Results from this research will enable communicators to provide needed information to farmers using accessible and preferred channels. The following objectives guided the study:

- Identify communication channels used by Malawian farmers when accessing agricultural information.
- Identify demographic factors associated with Malawian farmers' preferences for and use of communication channels.
- Identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers.

To achieve these objectives, the researcher developed a research methodology that included in-depth interviews with smallholder farmers and communication officers. This chapter provides a discussion of the study participant selection, research design, instrumentation, data collection and data analysis procedures used in this study.

Participant Selection

Two groups of individuals served as study participants in the current research: Malawian smallholder farmers and agricultural communication officers employed by the

Agricultural Communications Branch, Agricultural Extension Services, Ministry of Agriculture and Food Security. Participant selection procedures for each of these groups are outlined in the following sections.

Smallholder farmers

Smallholder farmers represent a primary audience for agricultural information in Malawi. To meet objectives of the study, the researcher used stratified random sampling to select 20 farm households from a list of farmers residing in the Lilongwe Agricultural Development Division (LADD) in the Lilongwe district. Stratified random sampling was used to ensure inclusion of males and females. Stratified sampling enables the researcher to study differences that may exist between various sub groups of the population (Ary, Jacobs, Sorensen, & Razavieh, 2010). Efforts to ensure inclusion of males and females were important because of variations suggested in the literature between men and women in terms of access to and use of communication devices and media.

The district from which farmers were selected was randomly picked from a list of districts in the central region. The central region was selected for the farmer study site because of its proximity to the central region in which ACB headquarters is located. The researcher determined that farmers residing in this area would have potential access to ACB messages and, accordingly, would be in a position to answer questions about its information products and services.

The list of farmers was provided by extension workers assigned to the area. All extension workers in the country maintain lists of farm families or households with which they work. Access to these lists enabled the researcher to easily identify individuals in the area whose main occupation was farming.

From the list, the researcher developed lists of males and females and randomly selected ten names from each list. The list included married couples in which both the male and female were farmers.

In this study, the researcher planned to visit 10 households where both the wife and husband would be interviewed to identify differences between men and women in accessing agricultural information. However, during the data collection phase, only five households were identified where both the husband and wife were present to be interviewed. In several cases, males selected from the list were not at home or were otherwise unavailable during the time the researcher visited the household. The final list of participants included seven men and 13 women.

ACB communication officers

Communication officers employed by the Agricultural Communications Branch of Agricultural Extension Services play a crucial role in the provision of agricultural information to Malawian smallholder farmers. The protocol specified that the researcher select up to 20 communication officers in the survey phase of the research. Accordingly, 20 names were randomly selected from a list of all the ADDs in the country to receive a semi-structured questionnaire.

The research design called for the communication officers who were currently working with the ACB so that the information captured was up to date and reflective of the current situation. The communication officers selected for participation in the study were selected from all the districts in Malawi because nearly every district in the country has a communication officer. However, as the researcher began to recruit subjects, it was learned through consultation with the chief communications officer that that there were

only eight established posts for communication officers and that the individuals working as communication officers in the district were only in acting appointments in those positions. It was also discovered some districts had no communication officers.

Research Design

The researcher sought to describe farmers' perceptions and use of communication channels in Malawi in order to improve agricultural information delivery among Malawian farmers. Therefore, the researcher focused on identifying factors that inform farmers' perceptions and use of the channels by considering such variables such as values, past experiences and preferences as well as information needs and access to the channel. Because Agricultural Extension Services plays a crucial role in agricultural message delivery in Malawi, the researcher also sought to identify the communication tactics used by the ACB in their communication efforts with smallholder farmers.

The researcher was guided by a post-positivist paradigm and used mixed methods including both qualitative (in-depth personal interviews) and quantitative (survey research) procedures. One strength of mixed-methods research is that it capitalizes on strengths of various research procedures and helps overcome biases associated with both qualitative and quantitative methods (Creswell, 2009). Qualitative research methods are useful in developing a deeper understanding of individuals' relationships, experiences, perspectives and imaginations (Mason, 2002; Ary et al., 2010), all of which are important in the decision-making process. Quantitative research methods are helpful in describing and summarizing demographic and attitudinal characteristics of samples and populations.

In the current research, in-depth interviews were used to identify factors affecting farmers' preferences for various communication channels. As a qualitative research

method, in-depth interviews can be useful in giving voice to marginalized groups (Creswell, 2009). In the current context, smallholder farmers in Malawi are marginalized to the extent that communicators may assume they know the best ways to communicate with this group. Professional communicators may not have access to current data on farmers' informational needs or they may pay inadequate attention to farmers' limited access to certain communication channels as they develop and disseminate agricultural messages. In-depth personal interviews enable the researcher to observe the subject and to view the surroundings and circumstances in which the subject is responding (Ary et al., 2010). As discussed below, interviews were conducted at participants' residences to allow the researcher to make observations and record them in field notes. In addition, in-depth interviews can overcome communication problems associated with illiteracy and low levels of education as questions are posed orally to subjects and can be rephrased or clarified if necessary.

Survey research techniques were used to measure demographic and attitudinal characteristics of ACB communication officers. Survey data can be efficiently collected from audiences who have adequate levels of education and literacy, are accessible by surface and electronic mail, and have an interest or stake in the data being collected. All of these conditions were satisfied with the communication officers selected to participate in this research.

The collective use of both types of research methods can help provide a more thorough explanation of the problem that neither method can provide independently (Ary et al., 2010). Details about the study participants, instrumentation, data collection, data analysis and other aspects of the research are provided in the following sections.

Instrumentation

The researcher developed instrumentation to meet the objectives of the study. Guided by elements of uses and gratifications theory and diffusion theory, the researcher developed a protocol and instrument for use in administering in-depth interviews with smallholder farmers. A script was developed to guide the researcher in introducing the research to subjects and encouraging their voluntary participation. A question route instrument was developed to ensure that questions were administered accurately and consistently across all the interviews. Semi-structured questions were used because of the recognition that some questions suggested by the theoretical perspective could not be answered without elaboration. Open-ended questions were also used to capture responses that could not be anticipated by the researcher yet may have an important bearing on farmers' decision-making process. The interview instrument used with farmers is provided in Appendix B.

The opening questions on the instrument collected demographic information such as gender, age, education level, occupation, years farming and marital status. Questions were then developed on farm characteristics, including size of farm and farm enterprises. To learn more about subjects' socioeconomic characteristics, a series of questions address subjects' primary sources of income, memberships in clubs and cooperatives, and various household assets, including ownership of and access to communication devices. A number of questions focused on subjects' awareness of, access to, and use of various communication sources, channels and types of information. Because a major objective of the research focused on improving information delivery to Malawian smallholder

farmers, a series of questions focused on subjects' current information habits and perceived needs.

Instrumentation developed for the communication officer component of this research included a research protocol, cover letters and a structured survey instrument. The research protocol helped guide the researcher in contacting and following up with potential subjects in a consistent and professional manner. A cover letter, which accompanied each survey instrument sent to subjects, explained the purpose of the study, encouraged voluntary participation of communication officers and provided instructions for returning the completed instrument.

The survey instrument, which utilized a combination of closed- and open-ended items, opened with items tapping subjects' various demographic characteristics including age, sex, years of service and qualifications. A series of items asked subject to identify communication channels used by ACB, types of messages (crop production, animal production, fish farming, other), and perceived performance of ACB in meeting farmers' needs. Also included on the survey instruments were items that asked participants to identify any changes they had seen in procedures used in agricultural message delivery, the perceived impact of any such changes, and challenges that affected ACB's ability to deliver information to farmers. The final item on the instrument asked participants perceptions of things that might be changed to enhance ACB's ability to meet farmers' information needs. The survey instrument used with communication officers is provided in Appendix C.

Field Testing

The researcher conducted field tests with the instruments developed for this study to assess their content validity and to determine the typical length of time needed to administer the interviews and for subjects to complete the questionnaire. Field testing was carried out in two phases, beginning first with testing of the farmer interview questions and proceeding with the communication officer questionnaires.

Field testing of farmer interview questions was conducted during the last week of April 2012 with 10 farmers from Mponela. The researcher administered the interview questions to the farmers when she was in the area to carry out other (unrelated) communication activities associated with her position. In administering the interview questions, the researcher attempted to simulate the instructions and conditions of testing to be subsequently used in the actual research interviews.

Field testing for communication officer questionnaires was conducted in July 2012 with 15 officers from DAES. Individuals participating in this phase of the field test worked in the same building as the researcher and were convenient to access. The test participants were judged to be similar to the communication officers that would later receive the actual research questionnaire. None had prior knowledge of the survey questions. Questionnaires were delivered to each of the field test participants along with written instructions for completing and returning the questionnaire to the researcher.

Several changes in phrasing and formatting were made to both instruments as a result of the field test. Several items interview items were rephrased to enhance the accuracy ease of translation. A number of communication officer questionnaire items as

well as questionnaire instructions were rephrased in response to concerns about clarity and confusion about how to rank some of the items.

Research Approval

In preparation for this study, the researcher sought permission from the Malawi Director of Agricultural Extension Services to collect data from smallholder farmers and from communication officers. Permission from the Department of Agricultural Extension Services to interview farmers was granted in January 2012 (Appendix D), and permission to survey communication officers was granted in May 2012 (Appendix E).

Purdue University approval to conduct the farmer phase of the study was requested in April 2012, and approval to conduct the communication officer phase of the study was requested in May 2012. The appropriate forms and documentation were completed and provided to the Institutional Review Board and Committee on the Use of Human Research Subjects of Purdue University in West Lafayette, Indiana. Both research protocols were deemed by IRB to meet the criteria for exemption and the researcher was authorized to proceed with the smallholder farmer phase of the research on April 30, 2012 (Appendix F), and with the communication officer research phase on May 31, 2012 (Appendix G).

Data Collection

Data for this study were collected through in-depth personal interviews with farmers and survey research with communication officers who completed a semi-structured questionnaire. As previously described, instrumentation utilized in this research was specifically developed by the researcher to meet this study's objectives.

Regarding data collection from farmers, an attempt was made for the extension worker assigned to the area to visit the farmers' homes in advance to introduce the researcher, explain the purpose of the study and encourage participation. This step was taken so that the researcher may be more easily accepted into the farmers' homes. When this arrangement was not possible, the extension worker introduced the researcher while the researcher was already there.

In the farmer phase of data collection, the researcher visited and conducted personal interviews with subjects at their residences. Some of the subjects invited the researcher to conduct the interviews in their homes while others agreed to an interview outside their homes. A maximum of three visits was made to a household. If the farmer was not available during any of the three visits, the researcher removed the subject's name from the list and randomly selected another farmer as a potential participant.

Before beginning the interview process, the researcher asked the subject for his or her consent to be involved in the study. Subjects who opted not to participate were thanked and no further communication was made. During this process, the researcher assured participants of the confidentiality of their responses.

A list of questions was used to frame the in-depth interviews. In addition, the researcher used a digital audio recorder to record subjects' responses. Before using the recorder, the researcher asked the subjects for their consent and assured them that the information would not be used for any purpose other than the research. When conducting the personal interviews, the researcher communicated with the subjects in their vernacular language Chichewa. Therefore, it was necessary for the researcher to translate all information, instructions and interview questions into the vernacular language so that

farmers were able to understand and participate in the research. Each interview lasted for about 20 minutes.

In the communication officer phase of data collection, the researcher emailed and mailed the questionnaires to subjects in their respective districts. In addition, the researcher took advantage of meetings that were conducted during the period of the study to administer the questionnaires to the communication officers. Phone calls were made to follow up with subjects and encourage their participation in the research. Such follow-ups were deemed especially important for questionnaires sent via email because of Internet access difficulties in some areas.

Twelve communication officers responded to the questionnaire. Follow-ups were made to investigate why some communications officers did not complete and return a questionnaire. It was discovered that the Ministry of Agriculture and Food Security has only eight communication officers in the ADDs and that the post of the District Communication Officer was not established in some districts. As a result, some individuals who work as communication officers in districts are not communicators by profession and are not fully committed to communication activities because they are also involved in other activities.

Therefore, the researcher distributed questionnaires to 20 communication officers in all the districts where there are communications officers. However, only 13 communication officers returned a completed questionnaire while seven did not respond.

Data Analysis

In this research, in-depth interviews with farmers resulted in the collection of textual data. Survey research conducted with communication officers resulted in

quantitative as well as textual data from open-ended questions included on the survey instrument.

As a preliminary step in data analysis, it was necessary to translate the farmer interviews from the vernacular Malawian language Chichewa into English. Data was then transcribed, entered into Microsoft Word and analyzed to identify common response patterns and themes. When identified, common themes were coded. Frequencies derived from the responses were entered into Microsoft Excel for descriptive statistical analysis including calculation of frequencies and percentages.

Survey data derived from communication officers were entered into and analyzed using the Statistical Package for Social Sciences (SPSS) version 16. Frequencies and descriptive statistics were calculated to summarize the results.

Limitations

This study has limitations resulting from the manner in which data were collected. First, farmer data were collected using in-depth personal interviews. The use of this qualitative research technique can result in rich data, but results should not be generalized beyond the sample. The size of the sample was also constrained by time and the necessity of devoting adequate time to ensure that interviews were transcribed and analyzed properly.

Second, the protocol called for the researcher to interview couples in households where the owners were married and living together. However, during the course of the research, it was observed that some women were unwilling to participate in the interview if their husbands were available. In these cases, the women suggested that their husbands were in a better position than them to provide the information requested in the interviews.

In some cases where women did participate, they provided different information from that provided by their husbands, especially on the issues of income, owned assets and farm size.

CHAPTER 4: FINDINGS

Purpose and Objectives

This chapter provides the outcomes of the study based on data collected and analyzed in the manner discussed in Chapter 3. The purpose of the study was to understand and describe Malawian farmers' perceptions and use of communication channels for accessing agricultural information. Results from this research will better enable communicators to provide relevant information to farmers using communication channels that are available, preferred and accessible to the farmers. In the following sections, the researcher discusses descriptive characteristics of the research subjects and addresses the three research objectives that were set forth, as follows:

- Identify communication channels used by Malawian farmers when accessing agricultural information.
- Identify demographic factors associated with Malawian farmers' preferences for and use of communication channels.
- Identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers.

Results

Descriptive characteristics of Malawian farmers

Respondents who took part in in-depth interviews as a component of this study were seven men and 13 women who were between 19 and 73 years old. Three (15%) of

the respondents indicated that they did not know their ages. Table 2 provides a summary of respondents' selected demographic characteristics.

In terms of education, it was observed that the highest qualification among respondents was the Junior Certificate of Education. From the sample that was interviewed, it was observed that women were the ones with the highest qualification (three women of the 20 farmers interviewed had earned the Junior Certificate of Education). Most of the respondents were literate. Finally, it was observed that among all the farmer respondents, one male and four females indicated never having attended school.

All of the respondents identified farming as their primary occupation and indicated they owned land for cultivation.

Table 2

Selected Demographic Characteristics of Farmer Participants

Respondent	Gender	Age	Education	Occupation
R1	Female	39	Standard 5	Farmer
R2	Female	29	None	Farmer/ Business woman
R3	Male	22	Standard 7	Farmer/Carpenter
R4	Female	(50)	Standard 8	Farmer
R5	Male	42	Form 2	Farmer/Shoe maker
R6	Female	19	None	Farmer
R7	Male	73	None	Farmer
R8	Female	(60)	None	Farmer
R9	Female	60	Standard 8	Farmer
R10	Male	(60)	Standard 3	Farmer/Painter
R11	Female	21	Standard 4	Farmer
R12	Male	62	Standard 8	Farmer
R13	Female	33	Form 2	Farmer/ Business woman
R14	Female	22	Standard 6	Farmer/ Business woman
R15	Male	23	Standard 8	Farmer/Builder
R16	Female	30	Form 2	Farmer
R17	Male	39	Did not specify	Farmer
R18	Female	27	Standard 7	Farmer
R19	Female	70	Standard 3	Farmer
R20	Female	21	None	Farmer

Note: Participants who did not know their ages provided an estimate, indicated in parentheses.

Land ownership among respondents ranged from half an acre to six acres. Results revealed that half of the respondents cultivated between one and two acres, while one male respondent indicated he owned up to six acres. Table 3 shows land ownership for participants by gender.

Table 3

Land Ownership for Farmer Participants by Gender

Land (acres)	Frequency		Total	Percentage
	Male	Female		
Not sure	0	1	1	5.0
0.5	1	1	2	10.0
1	1	4	5	25.0
1.5	0	1	1	5.0
2	1	4	5	25.0
2.5	1	1	2	10.0
3	1	0	1	5.0
3.5	1	0	1	5.0
4	0	1	1	5.0
6	1	0	1	5.0
Total	7	13	20	100.0

In terms of income from farming, nearly three-fourths (70%) of the respondents indicated farming as a source of income, with nearly one-third (30%) indicated they received no income from farming as they raised crops or animals for consumption purposes only.

Annual income from farming varied among respondents, ranging from MK15,000 to MK150,000 (approximately $103 to $1,034). All the respondents indicated that they grow maize on their land. Less than half (40%) of the respondents indicated they grow maize for consumption purposes only, while others indicated selling the surplus. Results indicated that the respondents are mainly involved in crop production, with maize rated as the major food crop grown by all respondents. Just under half (45%) of the respondents indicated they raise livestock, mainly goat and chicken. None of the respondents indicated raising dairy or beef animals.

In addition to their income from farming, half of the respondents indicated involvement in other income-generating activities such as shoe making, carpentry and painting. In terms of education, 75% of the respondents indicated that they had received some form of education while 20% indicated that they had never been to school. One respondent did not specify his or her level of education. Of the respondents indicating they had never been to school, 15% were women and 5% were men. Of the respondents who indicated having received some level of education, the least qualification was indicated as standard three (elementary education) while the highest qualification was indicated as form two (some form of middle high school).

Farmer respondents were also asked to identify the number and type of household items they owned. In terms of farm implement ownership, most (85%) of the respondents indicated that they owned a slasher (a hand-held implement similar to a scythe). This implement is typically used to cut maize stalks when harvesting maize as well as clearing the field in preparation for planting. In addition, 25% of the respondents indicated owning a hoe and a panga (a hand-held implement similar to a machete). The panga is typically used by farmers when harvesting maize and building storage structures for storing their produce. Some participants who indicated not owning a hoe mentioned that they borrow the tool from their friends while others said that they usually buy when the growing season approaches.

Descriptive characteristics of communication officers

The study included 12 communication officers. The communication officer participants were drawn from various ADDs in the country. They included five female and seven male respondents between 30 and 50 years old. About two-thirds (67%) of the

respondents were between 40 and 49 years old. In terms of years of service with ACB, results ranged from nine months to 20 years of service.

In terms of education, 25% of the respondents indicated having a college degree, while 8% indicated having a master's degree. Several of the communication officer participants indicated the Malawi School Certificate of Education (High School Diploma) as their highest educational qualification. Table 4 provides data on educational qualifications of the communication officer participants.

Table 4

Education Qualifications of Communication Officer Participants

Qualification	Frequency	Percentage
Secondary school certificate	4	33.3
Some College Certificate	2	16.7
College Diploma	3	25
First Degree	2	16.7
Master's	1	8.3
Total	12	100.0

Perceptions of communication channel use for agricultural information delivery

In this study, in-depth personal interviews were conducted with farmers to identify the communication channels they use when accessing general and agricultural information. In addition, survey research methods were used with communication officers to determine their perceptions of communication channels used by farmers. The following sections provide descriptive results from the farmer interviews and the communication officer survey.

Communication channels used by Malawian farmers

Farmer respondents were asked to indicate the communication channels they use when accessing general and agricultural information. Responses to these questions help establish farmers' communication channel preferences for different types of information. Results revealed that more than half (55%) of the farmers use radio when accessing general information, including at least half of both the men and women. The next most frequently used channels for general information were friends and neighbors (36%) and other people (27%).

When asked about the communication channels used for accessing agricultural information, more than half indicated using radio (60%) and Extension workers (60%), including more than half of both men and women. Only one respondent indicated using newspaper as a channel for receiving agricultural information. Table 5 displays farmers' responses for use of various channels for receiving general and agricultural information.

Table 5

Communication Channels Used by Farmers to Access General and Agricultural Information

Respondent Number	Channels Used	
	Other Information	Agricultural Information
R1*	Village Development Committee; friends who listen to radio program	Extension worker
R2*	Friends	Extension meetings
R3	Radio; Extension worker	Radio; Extension worker
R4*	Radio	Radio
R5	Radio	Radio
R6*	Friends	Extension worker
R7	Friends; neighbors, Extension workers	Extension worker
R8*	Radio	Radio
R9*	Radio; phone	Radio; Extension worker; newspapers
R10	Radio	Radio; Extension worker
R11*	Visitors	Radio
R12	Visitors	Extension worker
R13*	Radio	Radio; Extension worker
R14	Village meetings called by the chief	Extension worker
R15	Radio	Radio
R16*	Radio	Radio; Extension worker
R17	Researchers	Radio
R18*	Radio	Radio
R19*	Radio	Extension worker
R20*	Other people	Other people

* Female farmers.

Communication officers' perceptions regarding communication channels used by farmers

The survey instrument completed by communication officers asked respondents to identify the communication channels they thought were used by farmers when

accessing agricultural information. More than three-fourths (83%) of the respondents indicated knowing the communication channels used by farmers, while 17% indicated they did not know. In addition, 45% of the respondents indicated that farmers use cellphones when accessing agricultural information, while 42% indicated that farmers use meetings.

The communication officer respondents were asked to identify communication channels they thought were most frequently used by farmers. Results indicated that five (46%) of the respondents identified meetings as the communication channel most frequently used by farmers; cell phones were identified by three (27%) of the respondents. One respondent indicated not knowing the answer and declined to answer the question. Table 6 displays respondents' perceptions of communication channels thought to be used most frequently by farmers.

Table 6

Communication Officers' Perceptions of Information Channels Used Most Frequently by Farmers

Communication Channels Used	Frequency	Percentage
Meetings	5	45.5
Cell phones	3	27.2
Face to face	1	9.1
Drama	1	9.1
Do not know	1	9.1
Total	11	100

In addition, communication officer respondents were asked to indicate the channels that they think were least used by the farmers. Results showed that 18% of the

respondents identified leaflets, farmer business schools and cellphones, respectively. Table 7 shows the list of least used channels indicated by the communication officers.

Table 7

Communication Officers' Perceptions of Information Channels Used Least Frequently by Farmers

Channel Used	Frequency	Percentage
Leaflets	2	18.2
Farmer business school	2	18.2
Cell phones	2	18.2
Magazines	1	9.1
Video	1	9.1
Peer to peer	1	9.1
Do not know	2	18.2
Total	11	100.0

Demographic factors associated with farmers' choice and use of communication channels

In terms of ownership of communication devices, four of the 13 female farmers indicated that they did not own a communication device. However, when these farmers were asked to identify the communication devices that they would prefer to use, one out of the four women said, “I would prefer getting information through radio since I can easily get access to agricultural information.” One of the farmers indicated she would prefer getting information via print media because she is able to read while another farmer indicated she would prefer getting information via print media using leaflets as that would enable her to refer to the information whenever she needed it. Yet another farmer indicated she would prefer getting information through meetings and that “getting information from the group is important because it helps in sharing ideas and people are

able to encourage one another as such help each other. The group also provides a source of inspiration." Results revealed that radio was preferred by some of the respondents, as was print media, despite low levels of literacy.

Most (eight of 13) of the women who indicated owning a radio said their husbands controlled its use. This was the case for all the women, regardless of their level of education. Only one woman who indicated she was a lead farmer (a farmer who teaches other farmers about agricultural technologies) indicated having a radio in the home and controlling its use. In addition, this was the only farmer who indicated a preference for receiving information through the phone. She said, "I would prefer to be receiving messages on the mobile phone because that can help me get information fast and I can also pass it on to the other farmers quickly."

Techniques used by ACB to improve agricultural information delivery

Several items on the communication officer survey instrument addressed perceptions of ACB efforts to deliver agricultural information to smallholder farmers. More than half (seven) of the communication officer respondents identified dissemination of print media messages as one of the measures used by ACB to improve agricultural information delivery among Malawian farmers. However, when asked whether ACB meets farmers' information needs, 10 respondents reported a belief that ACB was not meeting all the information needs of farmers while two indicated ACB was meeting farmers' information needs.

The instrument also included an item that asked respondents to identify possible challenges the ACB may face in delivering agricultural information. In response to this question, nine communication officers indicated that challenges did exist, while three

indicated there were no significant challenges. Among the challenges listed by the respondents were inadequate financial resources, limited support from other players, inadequate skills, and mobility problems. Inadequate finances and limited support from other players were each indicated by 33% of the respondents.

In addition, the instrument asked respondents to suggest possible ways of improving delivery of agricultural information among the farmers. In response, eight survey participants perceived a need for change in the approach used when delivering agricultural information to farmers. Five participants indicated a need for improved coordination to improve delivery of agricultural information.

Respondents were asked to identify channels used by ACB in delivering agricultural information. Radio was indicated by all the respondents as one of the channels used by ACB to deliver agricultural information; radio was also rated as the most frequently used channel. All respondents but one identified posters and leaflets as communication channels used by ACB; 10 respondents reported that ACB uses magazines.

Regarding message content delivered by ACB, respondents were asked to identify whether information was delivered on crop production, animal production, fish farming or other topics. All respondents indicated that ACB delivers messages on crop production, while messages on fish farming were identified by respondents as least frequently delivered.

Respondents were also asked about the communication equipment available in their workplaces. It was observed that only 17% of the respondents indicated having computers at their offices. However, when asked about the communication equipment

used at their workplaces, all 12 respondents indicated using computers. In these cases, computers were commonly borrowed from other offices.

Respondents were asked to indicate the channels they use when delivering agricultural information to farmers. All but one indicated using leaflets; eight respondents indicated using meetings. Other channels such as radio were not indicated as the officers apparently mentioned only those channels they personally used on a regular basis. When asked what channels they most preferred using, more than half (N=7) of the respondents indicated a preference for using radio and campaigns. Reasons cited for this preference include the wide coverage area and ease in accessing farmers. Meetings and cell phones were identified as respondents' least-preferred channels for delivering information.

Farmers' Preferred Channels for Accessing Agricultural Information

One of the final questions posed in the in-depth interviews with farmers focused on preferred channels for receiving agricultural information and the reasons for this preference. A majority (10) of the respondents — six women and four men — indicated a preference for receiving information through print media. Reasons cited for this preference included convenience as well as flexibility. Respondents indicated that getting information through print media allows them to access the information at the time they wished. Leaflets were highlighted by a number of respondents as a preferred form of print media. According to one, "I would prefer getting information through leaflets because I will be able to access information easily because I do not meet the Extension worker all the time." Respondents indicated they would prefer getting information through print media because it offers a more thorough treatment of information and that it also enables them to refer back to the information whenever they wished.

Most of the respondents who indicated they were businessmen preferred receiving information through radio. Radio was rated as the second preferred channel by respondents since only four individuals identified it as their first choice for receiving information. Respondents indicated they could easily access information from the radio and that, by using radio to receive agricultural information, they could also receive information about such things as current affairs. Table 8 shows displays reasons cited by respondents for the channel preferences they identified in the interviews.

Table 8

Respondents' Reasons for Preferring a Communication Channel

Preferred Channel(s)	Respondents' Reasons for Channel Preferences
1 = Print 2 = Radio	"It will enable me to have access to agricultural information at my own time and convenience. This is because I am a busy person and may not usually meet the Extension worker so if I get information on print I will be able to read it on my own convenient time."
Radio	"I would prefer getting information through radio since I can easily get access to agricultural information."
1 = Print 2 = Extension worker	"I would prefer to get agricultural messages through the Extension worker though I would also love to get it through radio because sometimes I may not be able to meet with the Extension worker. I would also want to get the messages in print media so that I can read it at my own time."
Print	"I would love to get information in print media because I am able to read as such I can easily use the information. I want to get information in print media because I can always refer back to the book whenever I want to compared to other means."
1 = Radio 2 = Extension worker	"I prefer getting information through the radio in addition to the visits by the Extension worker so that I also get to hear what other farmers in other areas are doing."
Farmers in a group setting	"Getting information from the group is important because it helps in sharing ideas and people are able to encourage one another as such help each other. The group provides a source of inspiration."
1 = Extension worker 2 = Print	"I would prefer getting information from the Extension worker; however, I would have loved if I could get some information on print media because I have not had access to any information on print."
Mobile phone	"I would prefer to be receiving messages on the phone because that can help me get information fast and I can also pass it on to the other farmers quickly."
1 = Radio 2 = Print	"I would prefer getting information from the radio 'cause I listen to it every day and can get information whenever it is aired. I have chosen to be getting information from the radio because it can also help me get information on other things in addition to agricultural information. I would also like to get messages on print because it can enable me to remind myself because it gives one a chance to go and reread the material in case they forget."
Radio	"I would prefer getting information through the radio because when listening to the radio I am able to access more information of what is going in other parts of the country."
1 = Print 2 = Radio 3 = Extension worker	"I would prefer getting information through leaflets because I will be able to access information easily because I do not meet the Extension worker all the time.
1 = Print (leaflets)	"I would prefer getting information through leaflets because I will be able to access information easily because I do not meet the Extension worker all the time."

1 = Print (leaflets)	"I would like to be getting information in print form through leaflets because that will make me have thorough information."
1 = Print	"I would prefer getting agricultural information in print media because I would be able to refer back. The channel that I would prefer most in accessing agricultural information is print media because I can choose what I want to read and when I want to read. I would love to be getting information in print media since I hear there are plans to open a library. I would prefer getting information in a print media because I will be able to access it at my own time depending on my schedule and I can pick what I want to read compared to the Extension worker who may come when I am away and it is easy for me to forget."
1 = Print	"I would prefer getting information in print media because I can also be referring to the paper while for the radio once I forget I may not be able to refer back but as for the print I will be able to keep it and use it any time I want. In addition, I can easily share the information that I get in print with my friends while for radio I can't. I prefer print media because I can access it any time even, when I do not have batteries because with the radio once I do not have batteries then I miss out on the information. In addition, I can also show my friends information on print media while for the radio I will not be able to show them."
1 = Radio 2 = Extension worker 3 = Print	"I would choose getting information from the Extension worker because she/he would visit me personally and advise me on how to improve my farming. I would prefer getting information in print media because I would be able to understand what to do but I feel from the radio the announcer can make a mistake. I feel the radio is good because it helps you access a lot of information. Therefore, on agriculture, I would prefer getting information in print so that I can always go back and read if I happened to miss out on any information. However, since there are no print messages at the moment I will continue listening to the radio because I feel I will need to wait for a long time to get information in print media so that I start using the information right away."
1 = Print 2 = Extension worker 3 = Radio	"I think by getting information through print media because I will be able to read and understand properly. However if it is not possible for me to get information through print, I will love to get it through the radio. I also feel that radio is important when accessing agricultural information and I would love to get information through the radio."
Radio	"I would prefer getting information from the radio because it will help me have timely information which will help me improve my farming."
Extension worker	"I would prefer to get this information from the Extension worker through word of mouth so that I understand better."

CHAPTER 5: DISCUSSION AND CONCLUSIONS

Introduction

This chapter summarizes study objectives, discusses and elaborates on findings, and then offers recommendations and implications for future research.

As one of the developing countries in Africa located in the sub-Saharan region of southeastern Africa, Malawi is the world's fifth poorest country with the majority of women and children suffering the most from poverty (Canadian International Development Agency Report, 2013). Because agriculture is central to Malawi's economy, the country's development strategies and policy reforms concentrate heavily on this sector (Harrigan, 2003). Much of the recent reform in the country has targeted smallholder farmers, who constitute the largest percentage of farmers in the country and are faced with low productivity and limited access to inputs. Most smallholder farmers are involved in subsistence agriculture. Many are concentrated in rural areas and face difficult living conditions.

The Department of Agricultural Extension Services (DAES) is mandated to provide extension services to enhance adoption of improved agricultural technologies for all gender categories and vulnerable groups. Smallholder farmers are a primary target group for extension services since they constitute a large proportion of all farmers and play a significant role in ensuring the country’s food security. The department implements its

activities through the following branches: Food and Nutrition, Agribusiness, Gender, Extension Methodologies, and Agricultural Communication (ACB). While DAES personnel and programs have goals of helping farmers increase incomes, food security and productivity, they face significant challenges, such as limited resources and low levels of staffing, that hamper their ability to fulfill their mission.

The ACB uses several different communication channels to disseminate messages to farmers. Among these channels, print and radio are used most frequently. Because there is no established mechanism for regularly obtaining farmer feedback regarding their access to and use of various communication channels, communication personnel lack research-based information to guide their efforts. It is not known if messages disseminated via these channels address farmers' needs. The current study was conducted to help communicators improve information delivery among Malawian smallholder farmers. The research reported here was designed to address the following research objectives:

- Identify communication channels used by Malawian farmers when accessing agricultural information.
- Identify demographic factors associated with Malawian farmers' preferences for and use of communication channels.
- Identify common information delivery methods used by ACB in transmitting agricultural messages to Malawian farmers.

A theoretical perspective developed from components of diffusion of innovations and uses and gratifications theories was used to guide this research (Rodgers, 1995; Ruggiero, 2000). The diffusion of innovations theory highlights factors such as social prestige, convenience, satisfaction, consistency with existing values, past experiences and needs of users as factors affecting an individual's decision to adopt and use an innovation.

Diffusion is the process by which an innovation is communicated through certain channels over time to members of a social system (Rogers, 2003). Communication channels are crucial in encouraging adoption of an innovation because they carry information that reduces uncertainty about new technologies (Adolwa et al., 2012). The theory suggests that apart from economic importance, individuals value innovations based on social prestige, convenience and satisfaction as well as consistency with their values and personal needs (Rodgers, 1995). Also acknowledged in diffusion theory are the importance of relative advantage afforded by an innovation and its compatibility with existing practices and beliefs.

Uses and gratifications theory asserts the importance of satisfaction, past experience and existing needs of individuals when choosing mass media channels. Uses and gratifications theory describes the social and psychological factors that influence use of a specific communication medium. The theory asserts that people tend to develop relations with and choose media channels that provide the information they want and offer them maximum satisfaction (Ruggiero, 2000). When it comes to use of media, individuals make choices based on their desire to satisfy a potentially broad range of needs. Audiences are assumed to be active decision-makers, basing their media-use decisions on previous experience with the medium and the extent to which it addresses various needs and aspirations (Livaditi, Vassilopoulou, Lougos, & Chorianopoulos, 2003). Research shows that farmers respond positively to media that address their information needs and that their preferences for various media are associated with such factors as age and economic status. For example, use of visuals has been reported to be inversely related to age (Gravoso & Stuart, 2000). In addition, studies indicate

entertainment, especially radio dramas, are preferred by farmers when accessing agricultural information (Ferris et al., 2008).

Summary of Findings

This section summarizes results of in-depth interviews with Malawian smallholder farmers and results of survey research conducted with communication officers of the Agricultural Communication Branch.

Farmer data were collected using a question route developed and field-tested by the researcher prior to data collection. Twenty farmers were randomly selected from a list maintained by the Department of Agricultural Extension. The researcher visited farmers at their homes, provided instructions to farmers as specified in the research protocol, and administered in-depth interviews using a semi-structured list of questions designed to address the study objectives. Interviews were conducted in Malawi's vernacular language, Chichewa. Responses were recorded and translated into English for analysis.

Farmer-participants were seven men and thirteen women ranging in age from 19 to 73. The Junior Certificate of Education was the highest educational credential earned. One-fourth of the participants never attended school. All of the respondents identified farming as their primary occupation. All of the respondents indicated growing maize for sale or for their own consumption. Less than half reported raising livestock, such as goat or chicken.

In terms of farm implements owned, most participants indicated owning a slasher while much fewer indicated owning other implements such as a hoe or panga. Such circumstances help illustrate the serious challenges facing Malawian agriculture as most

farmers do not have the most basic and useful equipment needed for farming. None of the farmers indicated owning oxen.

In terms of communication channel use for general information, radio was the most frequently mentioned, followed by friends and neighbors, and other people. Radio and extension workers were most commonly mentioned by participants when accessing agricultural information. A majority of women owning radios reported that their husbands control its use. Despite the frequent use of radio, about half of the respondents indicated a preference for receiving information through print media, such as leaflets. Radio was the second-most-preferred channel for receiving agricultural information.

Communication officer data were collected using survey research methods. The research protocol called for the random selection of 20 communication officers to receive a semi-structured questionnaire. A survey questionnaire, developed specifically for use in this study, utilized a combination of closed- and open-ended items that collected information on subject's demographic characteristics, their perceptions of ACB services, and their perceptions of farmers' informational needs and preferences. Instrumentation was field-tested prior to data collection.

The researcher emailed and mailed the questionnaires to subjects in their respective districts and also administered the questionnaire to subjects during regularly scheduled meetings held during the period of the study. As the protocol was administered, the researcher learned that communication officers were not currently staffed in all districts as originally thought. Twelve communication officers responded to the questionnaire.

ACB communication officer study participants were five females and seven males between 30 and 50 years old. Years of service in ACB ranged from less than a year to 20

years. About one-fourth of the communication officers indicated having earned a college degree.

In terms of communication channels thought to be used by most frequently by farmers, nearly half of the communication officer participants identified meetings; cell phones were identified by one-fourth of the subjects.

A large majority of the subjects expressed a perception that ACB was not meeting all the information needs of farmers. The most commonly cited impediments to delivering agricultural information were insufficient resources, limited support from other players, inadequate skills and mobility problems. In terms of communication equipment, most participants indicated they did not have computers in their offices, but all indicated gaining access to a computer by borrowing one from other offices. In terms of their channel preferences for delivering agricultural information, radio and campaigns were mentioned most frequently, mainly because they offer a relatively wide coverage area and can be easily accessed by farmers.

Discussion

Channels used by Malawian farmers

Results from this research are consistent with the results of a study conducted by Farm Radio Malawi that Malawian farmers most often use radio when accessing agricultural information, followed by use of Extension workers (Farm Radio Malawi, 2008). Study findings revealed that the availability of radios makes it convenient for farmers to listen to radio programs. This finding was highlighted by one of the farmers who indicated that she is able to get information from the radio even when she is performing other tasks. Therefore, it can be concluded that farmers' use of a communication channel is

heavily influenced by their physical ability to access a medium and by the ability to use the medium at a time that is convenient for them (Awa, 1982**)**.

Farmers participating in this study also expressed a preference for receiving information in print media form although they indicated never having accessed any message in print. This finding was somewhat surprising considering the significant production of print materials by ACB, including a bi-monthly farmers' magazine distributed to ADDs for dissemination to farmers.

In another case unanticipated by the researcher, farmers without radios indicated a preference for receiving information via radio. Subjects indicated they could still access a radio from friends even if they do not own one themselves.

Farmers' access to media and their literacy levels appeared to exert limited influence on their communication channel preferences. In one such case, illiterate farmers continued to indicate a preference for receiving information in print. The subjects indicated they do not have to read all of the printed material for it to be of benefit. In addition, they indicated that the illustrations used in publications such as posters can help them understand the messages.

Demographic factors associated with farmers' choice of a communication channel

Study findings demonstrated an apparent relationship between demographic characteristics and farmers' communication channel preferences. Ownership of a communication device such as radio was associated with one's level of education, especially for women. Respondents who reported owning a communication device tended to report higher levels of education than those who did not own a communication device. This finding may be a result of the fact that lower levels of education levels are typically asso-

ciated with more limited income, especially for women (GoM, 2010). Further underscoring the influence of education on communication channel use is the finding that farmers who indicated never having been to school often reported reliance on the Extension worker for agricultural information.

Women may be more highly affected by this disparity because of their lower education levels, which limit their chances to be fully employed. In addition, inequalities that exist in the employment sector expose some individuals and especially women to low wages, salary cuts, denial of maternity leave, long working hours and inadequate rations (Ngwira & Mkandawire, 2003). In cases where women have access to casual labor, they often use the income to help feed their families as opposed to buying devices such as a radio. Study findings revealed that most female farmer respondents did not have control over the use of communication devices such as radios in the household. Most of the women who indicated having radios in their homes reported that their husbands controlled use of the device. Only one woman in the study indicated she controlled use of the radio in the household. It was noted that this woman was a lead farmer who took an active role in farming compared to her husband.

Communication officers' perceptions of communication channels used by farmers

Analysis of communication officers' perceptions of farmer media preferences reveals gaps in their understanding of this important target audience. Communication officers participating in this study indicated using print media channels to disseminate agricultural information as one of the measures being used to improve delivery of agricultural information. Reports indicate that efforts are under way by some non-governmental organizations who work in collaboration with ACB to establish radio

listening groups as a way of improving listenership of agricultural radio programs. It is estimated that 90% of farmers in Malawi rely on radio listening groups for agricultural information (Farm Radio Malawi, 2008). Yet, none of the communication officers indicated use of radio listening clubs as an important technique for improving delivery of agricultural information.

When asked to identify the communication channels they thought were most frequently used by farmers to access agricultural information, nearly half (45%) of the communication officers indicated meetings. None indicated radio as one of the communication channels used by farmers.

The communication officers participating in this research were often unaware of the communication channels used by ACB in disseminating agricultural information. When asked to indicate channels used by ACB when delivering agricultural information, most indicated meetings as one of the channels, despite the fact that meetings are not among the channels used by ACB to disseminate agricultural information. The finding that Malawian farmers express preferences for print media has significant implications for training of ACB staff.

Further, it was learned through this research that communication officers were often not familiar with measures used by ACB in improving dissemination of agricultural information. When asked about such measures, most communication officers indicated that ACB was providing information via print media. However, data collected from farmer-participants in this study revealed that they had not received information in print-media form. At the same, the literature reviewed as a part of this research revealed that the establishment of radio listening clubs is one of the measures used by other NGOs in

collaboration with ACB. However, none of the communication officers mentioned this collaboration in their responses.

Contributions of Theoretical Perspective

The theoretical perspective employed in this study was developed from elements of diffusion of innovations theory and uses and gratifications theory. The perspective was shown to be useful in conceptualizing the agricultural communication process and in interpreting study results.

The study revealed that farmers' preference for a communication channel was based at least partially on convenience and perceived ability of the medium to provide desired information. This finding is consistent with one of the assumptions of the diffusion of innovations theoretical perspective that an individual's choice of a medium is purposeful and motivated by an informational need that he or she wants to satisfy (Livaditi et al., 2003). Additionally, it was observed that farmers expressed a preference for print media because of the unique perceived benefits afforded by these media: Printed materials can be kept by individuals and accessed at a later time if desired. While low rates of literacy on the part of farmers were initially thought to dampen preferences for print media, findings affirmed the uses and gratifications assertion that channel preferences are based on many factors and not strictly the ability to provide information.

The combination of uses and gratifications and diffusion of innovations theoretical perspectives has great potential to inform future agricultural communication research in Malawi and other developing countries. Uses and gratifications theory points to the decision-making power of the receiver in the communication process to select and use the media and methods that best suit his or her needs and motivations. Not all of a

receiver's informational needs, motivations or communication preferences are readily apparent to communication sources, which underscores the need for ongoing audience analyses.

In many developing countries, communication may appropriately be thought of as a farm input that can enhance agricultural productivity. In the diffusion theoretical perspective, effective communication is conceptualized as a necessary but not sufficient condition for adoption of recommended innovations. Adoption is a complex process that involves many factors. While effective communication plays a critical role, other attitudinal, economic and farm structure factors are also in play. Future research aimed at understanding these factors needs a sound social-scientific basis that includes but is not limited to communication concepts or objectives.

Recommendations

Based on study findings, the researcher proposes the following recommendations to assist in improving delivery of agricultural information among Malawian farmers.

First, there is a need to assess and reconsider the mechanisms by which print messages are disseminated to farmers to ensure that farmers in all districts in the country gain access to printed information. Currently, print messages are delivered to the ADD or district and officers are expected to deliver the messages to EPAs. However, study results revealed that not all farmers are able to access the messages. The study did not address how the information delivery mechanisms function or how they might be improved, but it did establish that participating farmers did not recall receiving printed information. A program evaluation is warranted to determine how current information delivery proce-

dures might be modified or otherwise improved to help ensure that messages consistently and efficiently reach farmers.

In addition, there is a need to design and conduct orientation workshops and on-going training programs for communication officers so that they are familiar with the information channels deployed by ACB. This recommendation is in response to the study finding wherein it was observed that communication officers could not properly identify communication channels used by ACB to disseminate agricultural messages to farmers. In addition to providing training for communication officers, it would be beneficial to support a communication library or other educational resources wherein communication officers could access recent literature and research-based information regarding audiences and recommended agricultural communication practices.

To leverage its resources and reach, it is further recommended that ACB improve coordination with other stakeholders so that communication officers are familiar with the communication activities of other organizations, such as NGOs. Improved coordination and collaboration with such organization could help improve ACB's delivery of agricultural information.

Additional recommendations involve potential changes in staffing and organizational structure on the part of the Ministry of Agriculture and Food Security and the ACB. For example, during the course of the research, it was learned that there were only eight established posts for communication officers in the country and that several individuals working as communication officers were only in acting appointments without significant communication expertise or training. It was also discovered some districts had no communication officers. Given the importance of the communication function in improving

farmer adoption and decision-making regarding best agricultural practices, it is important that administrators make communication staffing a priority. It should also be acknowledged that filling of staff vacancies can be very difficult in the current resource environment. Because communication professionals fulfill a critical linkage in diffusing information from scientists and experts to farmers, it is imperative that the organization maintain adequate communication capacity.

In addition to maintaining communication staffing levels, there is a need for ongoing audience research or needs assessment research on the part of ACB to identify the communication channels used by farmers. Such information is needed by ACB personnel *before* deciding on the communication channel or channels to be used for disseminating messages. An evaluation section was formerly housed at ACB and is now under the Department of Planning. However, the evaluation section is not active. The lack of farmer audience feedback makes it difficult for ACB to carry out its communication mission relative to the delivery of agricultural messages. Currently, there appears to be no clearly established mechanism for assessing the communication channels used by farmers so as to ensure they have reliable access to needed information.

A possible solution is to re-establish the evaluation section of ACB to ensure that communication officers have ongoing access to audience feedback and other data to help them effectively target agricultural information to farmers. It should be noted from the study findings that communication officers acknowledged difficulties in fulfilling their mission. When asked if ACB meets the information needs of farmers, several communication officers shared their view that it does not. In actuality, the communication offices

have very little basis for assessing their performance because there are no evaluation procedures in place to provide such feedback.

Limitations of the Study

As is the case in all empirical investigations, the current research has limitations that readers should consider as they interpret results and conclusions. First, owing to the qualitative nature of the current, work, its results cannot be generalized to the population. It is also important to point out that the farmer data were collected in only one region and one village in Malawi. While this study should be replicated in other regions of the country so that proper measures can be taken to improve delivery of agricultural information, results from the current investigation can be used to form a basis for conducting future studies.

A second limitation concerns language. The vernacular language for Malawi, Chichewa, was the language used when interviewing the farmers. However, the Chichewa language is limited in that it lacks the number and variety of words found in English. Due to this limitation, farmer participants in this research could likely not respond to questions and express themselves to the degree possible had they the ability to communicate in English. Limitations due to language are also likely compounded by low levels of literacy on the part of the farmer participants.

In terms of research design, the researcher observed that the presence of the extension worker during data collection may have had an unintended effect on subjects' responses. As outlined in chapter 3, the research protocol for the farmer phase of data collection called for an extension worker to accompany and introduce the researcher to farmers at the time of the interview. The presence of the extension worker may have had

a filtering effect on farmers' responses. In some cases it was observed that the farmer's attention was more focused on the extension worker and their grievances about problems they face working with them rather than focusing on the researcher's topics. In one case, a farmer-participant opted not to take part in the study because of problems between him-self/herself and the extension worker.

A final limitation of the current research concerns the relative lack of scholarly literature especially regarding the use of print media usage among Malawian farmers. The limited amount of empirical research in Malawi created a challenge in developing rec-ommendations. The researcher relied in part on literature from other countries when forming conclusion and recommendations.

Implications for Future Research

A common byproduct of the social science research process is the identification of additional questions that should be pursued in future research. It is also often the case that researchers learn that new or modified research designs or other features should be incor-porated in future research to improve the validity or reliability of data. Results from this study suggest several areas in which future research might be conducted.

First, it was discovered through this research that Malawian farmers rely on mass media as well as interpersonal channels for agricultural information. While the current work helped provide a more complete picture of farmer's informational preferences and needs, future research should focus specifically on farmers' willingness and ability to use new technologies for receiving agricultural information, including cell phones. While the current research identified only one farmer who expressed a preference for receiving ag-ricultural information through a cell phone, it is likely that this technology will become

more widespread in the future. Measurement of farmers' uses of and preferences for cell phones is essential to use these communication technologies to their full potential.

Also needed is research that identifies and examines 'social networks used by farmers in the decision-making process. Such a recommendation is supported by the diffusion of innovations theoretical perspective used to help guide this research. Because individuals who are active in social networks are more likely to adopt innovations than those who are not (Bandura, 2009), it is important to gain a deeper understanding of social networking patterns and structures in the context of Malawian smallholder farmers. Cell phones may well play an important role in these networks in the future.

Other particularly important lines of inquiry for future research are the measurement of farmer perceptions regarding climate change, and farmers' communication channel preferences for learning more about this phenomenon. In Chapter 1, it was noted that Malawi is experiencing changes in rainfall patterns that could significantly affect the livelihoods of smallholder farmers, most whom rely on rain-fed agricultural practices to raise crops. Special circumstances such as climate change may warrant special information campaigns and targeted messaging to make farmers aware of recommended production changes and technologies. To implement effective campaigns, it is critical that professional communicators have access to audience feedback throughout the process to identify relevant social networks, coordinate use of interpersonal and mass communication channels, and disseminate targeted messages to achieve campaign objectives.

Through the current research, it was learned that communication officers were sometimes unaware of the communication channels used by farmers. There is a need for research to help the Ministry of Agriculture and Food Security restore an expert evalua-

tion unit to provide data that can help focus, refine and measure the impact of communication efforts. A needs assessment is needed to assist the ministry in identifying strategic priorities, resources and a timeline for establishing or restoring important organizational functions such as audience analysis and impact analysis.

Future research could benefit from examining the unique dynamic between men and women of Malawi, particularly during farm decision-making processes. Current research has shown Malawian women to defer and at times depend on men for much of the household's farm decisions, despite the significant role they play in agricultural production. In addition to their dominance over women in farm decision-making, men rather than women typically controlled access to communication devices. Improving the delivery of agricultural communication in Malawi requires change agents and professional communicators to have a better understanding of farm-level decision-making processes and how they are influenced by the dynamics between men and women.

Finally, results from the current study have implications for improving future research protocols used with farmers and communication officers. In future research with farmers, it is also recommended that the extension workers, when involved in recruitment, alert study participants a week prior to data collection. Notifying study participants of data collection dates in advance may help subjects focus on the topics being discussed at that particular time. It is also recommended that future research avoid having the extension worker present during data collection to avoid or minimize any filtering effect.

In future research with communication officers, it is recommended that multiple research methods be used to improve the quality of data. In the current research, survey methods were used to measure communication officers' perceptions of their own behav-

iors and preferences as well as their perceptions of farmers' information preferences. During data analysis, the researcher found that the sole use of survey methods to collect data denied subjects a chance to elaborate and provide additional details on some of the issues raised. The researcher concluded that the use of a qualitative data collection method, such as in-depth personal interviews or focus group interviews, would have provided a more complete picture and insights into the study variables as compared to survey methods alone.

Conclusions

Results from this research can be used in at least three ways to help improve the delivery of agricultural information in Malawi. First, results from the farmer phase of this research can be used to help target information to agricultural audiences. Results from the communication officer phase can be used to gain a more complete picture of the orientations and needs of communication staff. Importantly, these results provide a picture of agricultural communication in Malawi at one particular point in time. Because organizations, audiences and technologies are constantly in flux, there is a need for ongoing research to continue to understand and improve the communication process with farmers and other audiences.

A second way this study can be used to benefit agricultural information delivery in Malawi is to consider the research protocol used here as a template for future research. The development of a literature base, theoretical perspective, and research design provides a blueprint for future work. As discussed previously, improvements can and should be made to the protocol in future iterations, yet the current research design shows promise for helping improve agricultural information delivery to Malawian farmers.

Finally, this study affirms the important role played by communication professionals in the diffusion process and the necessity of audience analysis to help direct their activities. Communication can be a powerful tool in diffusing new information and ideas to farmers. Timely, relevant messages delivered in a form that is accessible and convenient to farmers can help them improve productivity in their fields. Increased farm productivity can enhance the standard of living in households and villages. Results from the current research represent a modest, early step in this direction.

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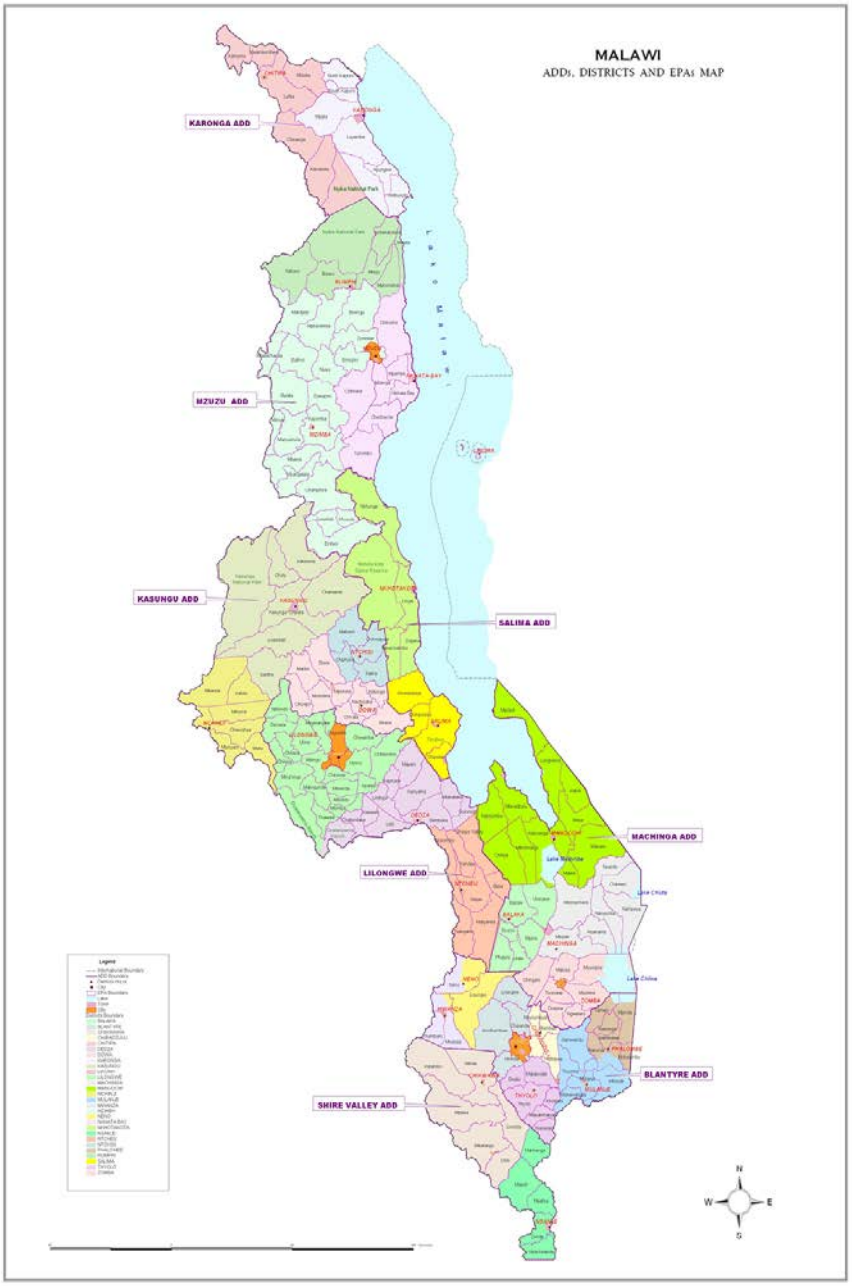
APPENDICES

APPENDIX A

MAP OF MALAWI AND EXTENSION PLANNING AREAS



APPENDIX B

INTERVIEW INSTRUMENTATION USED FOR FARMERS

Introduction:

Hello, Thank you for welcoming me to your home. My name is Fallys Masambuka and I am a Master's student at Purdue University. I am here because I want to find out more from you about agricultural information. I don't know if you are willing to give the interview or not? (If the interviewee is willing I will go ahead if they are not I will go to the next household).

NAME OF INTERVIEWEE_____VILLAGE_____

TRADITIONAL AUTHORITY_____

SECTION A: DEMOGRAPHIC CHARACTERISTICS

Gender: _____ Age: _____

Education Level: _____

Occupation: _____

Marital Status 1=Single	2=Married	3=Divorced
4=Widowed	5=Separated	6=Others (Specify)

SECTION B. FARM CHARACTERISTERICS

1. How long have you been farming?

2. What is the size of your farm?

3. What farming enterprise are you involved in? Please list all the enterprises that you do in the table below and provide the size of the land that is allocated to each enterprise or number if livestock.

Type of enterprise	Area /number if livestock

SECTION C: SOCIO-ECONOMIC CHARACTERISTICS

4. What is your primary source of income?

5. How much money do you make from farming?

6. Are you a member of any group/club/association/cooperative?

   1=Yes 2=No

7. If yes, what type?

8. What activities do you do in that group/club/association?

9. How often does the group/club/association meet?

10. How often do you attend such meeting?

SECTION D: HOUSEHOLD ASSETS

11. In the table below please indicate the household assets that you own.

Item	**Quantity owned**	**Item**	**Quantity owned**
Plough		Radio	
Ox-cart		Television	
Iron roof house		Bicycle	
Slasher		Mobile phone	

SECTION D: ACCESS TO INFORMATION

12. Do you have access to any information?

1= Yes 2=No

13. If yes, what type of information?

15. How do you access the information?

16. Do you own any communication device in your household?

1=Yes 2=No

17. If yes, what communication devices? List the assets and quantity of each asset in the table below

Device	Quantity

18. Who controls the device?

19. How often do you use the devise?

SECTION E: KNOWLEDGE OF AGRICULTURAL COMMUNICATION CHANNELS

20. Do you know any institution/ organization that are responsible for delivering agricultural information?

1=YES 2=NO

21. If yes, list the institutions or organizations? For every organization listed provide the type of information that they provide and the channel that is frequently used?

Institutions/Organizations	Primary type of information delivered	Channel used

SECTION E: AGRICULTURAL INFORMATION NEEDS AND ACCESS TO INFOMATION

22. Is there any specific agricultural information that you need to help you in your farming?

1= Yes 2= No

23. If yes, what type of information?

24. Are you able to access that information?

1= yes 2=No

25. If yes, how do you access that information? Circle all that is applicable

1= through radio 2=Magazines 3=Leaflets 4=Posters 5=Puppet shows

6= Extension workers 7=others (specify) ======== [include in section D]

26. How often do you access the information using that channel?

28. On radio, what programmes do you listen to?

29. Why do you listen to that programme?

27. Are there any problems that you face when accessing the information using the channel?

28. If you were given a chance to choose a channel that you would prefer to use when accessing information, which channel would you prefer?

29. Why would you prefer using that channel?

SECTION F: KNOWLEDGE AND USE OF INFORMATION DELIVERED BY ACB

30. Do you know any type of information that ACB delivers?

1=Yes 2=No 3=Somehow

31. What type of information does ACB deliver?

32. What do you think about the information delivered by ACB?

1= relevant 2=Not relevant 3=Not sure

33. Does the information address your information needs?

34. Is there any type of information which you would have loved to be getting from ACB?

1= YES 2=NO NOT SURE

35. What type of information would you like the ACB to disseminate?

36. Why do you need such information?

37. When choosing a communication channel to use what things do you look for?

38. On a scale of 1-5 where 1 indicate most import and 5 not important, list the things that you consider important when using a communication channel?

39. Of all the channels used by ACB when delivering information is there any channel that you use most?

1= Yes 2=No

39. If yes? Which channel?

40. Why do you use that channel?

APPENDIX C

SURVEY INSTRUMENTATION USED FOR COMMUNICATION OFFICERS

Improving Agricultural Information Delivery in Malawi

Greetings!
You are receiving this questionnaire because you have been selected to participate in a survey considering your work and experience with the Agricultural Communication Branch. The purpose of this research is to improve agricultural information delivery among Malawian farmers. While your participation is strictly voluntary, please consider that your response is important to us so that we can gain an accurate picture of the goals and challenges of agricultural information delivery in Malawi. The attached questionnaire should take no longer than 20 minutes to complete.

The survey is part of my study for a Master of Science Degree in Agricultural Communication from Purdue University. I am employed by the Ministry of Agriculture, Irrigation and Water Development in the Department of Agricultural Extension Services with the Agricultural Communication Branch.

Please be assured that the information you provide in this survey is confidential. All survey responses will be combined for reporting purposes so there will be no way to identify individuals who completed or did not complete a questionnaire. Should you decide to participate, you may skip any questions you do not wish to answer, and you may withdraw from the project at any time. Completed questionnaires may be returned to my office or to my secure mailbox in the department. Please do not sign the questionnaire or provide any other identifying information.

I know you are busy and I thank you for considering this request. If you have any questions about the questionnaire or the project, please do not hesitate to contact me at any time.

Sincerely,

Fallys Masambuka
Attachment: Questionnaire

Improving Agricultural Information Delivery in Malawi

Please complete the following items. You may skip any questions you do not wish to answer.

Section A: DEMOGRAPHIC INFORMATION

AGE: _____ (enter number of years)

SEX: M F (circle one)

PLACE OF WORK: _____

POSITION TITLE: _____

YEARS OF SERVICE TO ACB: _____

HIGHEST QUALIFICATION: _____

Section B: KNOWLEDGE OF COMMUNICATION CHANNELS

1. What communication channels does ACB use in delivering information to the farmers? (place a check next to the channels used)

Electronic	Print	Others (specify)
Radio	Leaflets	campaigns
Internet	Brochures	Mobile unit
Video	Posters	Peer to Peer
Cellular Phones	Magazines	Lead Farmer
Television	Newspaper	

2. Please list and rank (from 1 to 5) the top five communication channels used by the ACB:

   1._____ (most frequently used)

   2._____

   3._____

   4._____

   5._____

3. Why did you rank the communication channels as you did in Question 2?

4. What types of messages does ACB deliver? (circle all that apply)

   1 = Crop production

   2 = Animal production

   3 = Fish farming

   4 = Others (please list:) _____

5. On a scale of 1 to 5, please list and rank the content of messages most frequently delivered by ACB, where 1 represents the most frequently delivered and 5 the least frequently delivered:

   1._____ (content most frequently delivered)

   2._____

   3._____

   4._____

   5._____

6. Please assess the performance of ACB in meeting farmers' information needs. For example, is ACB's performance excellent, good, fair, or poor? Why?

7. What are some of the tactics or measures used by ACB to ensure that farmers have access to agricultural information?

Section C: COMMUNICATION CHANNELS USED

8. Please rank the channels below on a scale of 1-5 where 1 indicates the most frequently used channel to disseminate messages to farmers. Please rank only the top 5 channels.

Print	Electronic	Others
Leaflets	Radio	Campaigns
Newspapers	Internet	Drama
Magazines	Cell phones	Meetings
Posters		
Brochures		
Others (specify)		

9. Why do you use the channel(s) you ranked in Question 8?

10. Of the communication channels listed in Question 8, which do you prefer using?

11. Why do you prefer using the channels you listed in Question 10?

12. Are there any challenges that you face when disseminating agricultural information? (circle your response)

1 = No

2= Yes (if yes, what are the challenges?):

_____

_____

SECTION D: RESOURCES

13. What communication equipment is available at your work place?

14. Do you use all these equipment? (circle your response)

1 = No (if no, why?):

_____

_____

2 = Yes (if yes, list the communication equipment used:)

_____

_____

Section E:

KNOWLEDGE OF COMMUNICATION CHANNELS USED BY FARMERS

15. Do you know the communication channels that farmers use?

1= No

2= Yes (If yes, please list the communication channels used by farmers:)

_____

_____

16. On a scale of 1 - 5, where 1 represents channels used most frequently, please rank the top five communication channels used most frequently by farmers:

1._____ (channel most frequently used by farmers)

2._____

3._____

4._____

5._____

17. In your years of service at ACB, have there been any changes in the methods or procedures used in agricultural message development and delivery?

1 = No

2 = Yes (if yes, please list the changes:)

_____

_____

18. In your opinion, what has been the impact of changes listed in Question 17 on information delivery? (circle your response)

1 = Positive

2 = Negative

3 = Not sure

4 = No opinion

19. Why do you think the changes have had the impact mentioned in question 18?

20. In general, do you feel that the ACB meets farmers' information needs? (circle your response)

1=Yes

2=No

(Please explain your response:)

_____

_____

21. Other than financial problems, what challenges (if any) does ACB face when delivering information to the farmers?

22. Could anything be changed to better ensure that ACB meets farmers' information needs?

Thank you for participating in this research project! Please return completed questionnaire to office or secure mailbox of Fallys Masambuka.

APPENDIX D

DAES AUTHORIZATION LETTER FOR FARMERS

Tel : 01755 522
Fax : 01750 384

DIRECTOR OF AGRICULTURAL
EXTENSION SERVICES
P.O BOX 30145
LILONGWE 3

10TH JANUARY, 2012

TO : **WHOM IT MAY CONCERN**

PERMISSION TO CARRY OUT RESEARCH ON IMPROVING DELIVERY OF AGRICULTURAL INFORMATION AMONG MALAWIAN FARMERS.

Dear Sir/Madam,

Am writing to authorize Ms. Fallys Masambuka to carry out research with the farmers in your area on the above mentioned topic.

Ms. Fallys Masambuka is an employee of the Ministry of Agriculture, Irrigation and Water Development and works as a communication Officer in the Department of Agricultural Extension Services who is currently pursuing her Masters' Degree at Purdue University in USA. Therefore, as part of her Master's program she is supposed to carry out research with the farmers.

Your cooperation and assistance will be highly appreciated as the findings of the research will help the Ministry in addressing some of the problems that the farmers are meeting when accessing agricultural information.

Thank you.

Ms. S Kankwamba
Director of Agricultural Extension services.

APPENDIX E

DAES AUTHORIZATION LETTER FOR COMMUNICATION OFFICERS

Tel... 01755 522
Fax... 01750 384

DIRECTOR OF AGRICULTURAL
EXTENSION SERVICES
P.O BOX 30145
LILONGWE

18th May 2012

TO: WHOM IT MAY CONCERN

PERMISSION TO CARRY OUT RESEARCH ON IMPROVING DELIVERY OF AGRICULTURAL INFORMATION AMONG COMMUNICATION OFFICERS.

Am writing to authorize Ms. Eallys Masambuka to carry out research with the Communication Officers in your area on the above mentioned topic.

Ms. Eallys Masambuka is an employee of the Ministry of Agriculture, Irrigation and Water Development and works as a Communication Officer in the Department of Agricultural Extension Serviced who is currently pursuing her Masters degree at Purdue University in USA. Therefore, as part of her Masters program she is supposed to carry out research with the Communications Officers.

Your cooperation and assistance will be highly appreciated as the findings of the research will help the Ministry in addressing some of the problems that the Communication Officers are meeting when accessing agricultural information.

Thank you.

Ms. S. kankwamb'a
Director of Agricultural Extension services.

APPENDIX F

INSTITUTIONAL REVIEW BOARD APPROVAL — FARMERS

PURDUE UNIVERSITY

HUMAN RESEARCH PROTECTION PROGRAM
INSTITUTIONAL REVIEW BOARDS

To:	MARK TUCKER AGAD
From:	JEANNIE DICLEMENTI, Chair Social Science IRB
Date:	05/01/2012
Committee Action:	**Exemption Granted**
IRB Action Date:	04/30/2012
IRB Protocol #:	1204012188
Study Title:	Malawian farmers' perceptions and use of communication channels for receiving agricultural informa

The Institutional Review Board (IRB) has reviewed the above-referenced study application and has determined that it meets the criteria for exemption under 45 CFR 46.101(b)(2) .

If you wish to make changes to this study, please refer to our guidance "**Minor Changes Not Requiring Review**" located on our website at http://www.irb.purdue.edu/policies.php. For changes requiring IRB review, please submit an **Amendment to Approved Study** form or **Personnel Amendment to Study** form, whichever is applicable, located on the forms page of our website www.irb.purdue.edu/forms.php. Please contact our office if you have any questions.

Below is a list of best practices that we request you use when conducting your research. The list contains both general items as well as those specific to the different exemption categories.

General

- To recruit from Purdue University classrooms, the instructor and all others associated with conduct of the course (e.g., teaching assistants) must not be present during announcement of the research opportunity or any recruitment activity. This may be accomplished by announcing, in advance, that class will either start later than usual or end earlier than usual so this activity may occur. It should be emphasized that attendance at the announcement and recruitment are voluntary and the student's attendance and enrollment decision will not be shared with those administering the course.
- If students earn extra credit towards their course grade through participation in a research project conducted by someone other than the course instructor(s), such as in the example above, the students participation should only be shared with the course instructor(s) at the end of the semester. Additionally, instructors who allow extra credit to be earned through participation in research must also provide an opportunity for students to earn comparable extra credit through a non-research activity requiring an amount of time and effort comparable to the research option.
- When conducting human subjects research at a non-Purdue college/university, investigators are urged to contact that institution's IRB to determine requirements for conducting research at that institution.
- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without

proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

Category 1

- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

Categories 2 and 3

- Surveys and questionnaires should indicate
  - only participants 18 years of age and over are eligible to participate in the research; and
  - that participation is voluntary; and
  - that any questions may be skipped; and
  - include the investigator's name and contact information.
- Investigators should explain to participants the amount of time required to participate. Additionally, they should explain to participants how confidentiality will be maintained or if it will not be maintained.
- When conducting focus group research, investigators cannot guarantee that all participants in the focus group will maintain the confidentiality of other group participants. The investigator should make participants aware of this potential for breach of confidentiality.
- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

Category 6

- Surveys and data collection instruments should note that participation is voluntary.
- Surveys and data collection instruments should note that participants may skip any questions.
- When taste testing foods which are highly allergenic (e.g., peanuts, milk, etc.) investigators should disclose the possibility of a reaction to potential subjects.

APPENDIX G

INSTITUTIONAL REVIEW BOARD APPROVAL — COMMNICATION OFFICERS

PURDUE UNIVERSITY

HUMAN RESEARCH PROTECTION PROGRAM
INSTITUTIONAL REVIEW BOARDS

To:	MARK TUCKER AGAD
From:	JEANNIE DICLEMENTI, Chair Social Science IRB
Date:	05/31/2012
Committee Action:	Exemption Granted
IRB Action Date:	05/31/2012
IRB Protocol #:	1205012361
Study Title:	Malawian communication officers' knowledge and perceptions of agricultural information delivery

The Institutional Review Board (IRB) has reviewed the above-referenced study application and has determined that it meets the criteria for exemption under 45 CFR 46.101(b)(2) .

If you wish to make changes to this study, please refer to our guidance "Minor Changes Not Requiring Review" located on our website at http://www.irb.purdue.edu/policies.php. For changes requiring IRB review, please submit an Amendment to Approved Study form or Personnel Amendment to Study form, whichever is applicable, located on the forms page of our website www.irb.purdue.edu/forms.php. Please contact our office if you have any questions.

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proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

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- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

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- Surveys and questionnaires should indicate
  - only participants 18 years of age and over are eligible to participate in the research; and
  - that participation is voluntary; and
  - that any questions may be skipped; and
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- Investigators should explain to participants the amount of time required to participate. Additionally, they should explain to participants how confidentiality will be maintained or if it will not be maintained.
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- When human subjects research will be conducted in schools or places of business, investigators must obtain written permission from an appropriate authority within the organization. If the written permission was not submitted with the study application at the time of IRB review (e.g., the school would not issue the letter without proof of IRB approval, etc.), the investigator must submit the written permission to the IRB prior to engaging in the research activities (e.g., recruitment, study procedures, etc.). This is an institutional requirement.

Category 6

- Surveys and data collection instruments should note that participation is voluntary.
- Surveys and data collection instruments should note that participants may skip any questions.
- When taste testing foods which are highly allergenic (e.g., peanuts, milk, etc.) investigators should disclose the possibility of a reaction to potential subjects.