THE PERCEIVED CONTRIBUTION OF EXTENSION WORKERS IN MEETING FARMERS' INFORMATION NEEDS IN BUSIMBI SUB-COUNTY, MITYANA DISTRICT

BY

NNAMULONDO PROSCOVIA
B. MASS COMMUNICATION, MAKERERE UNIVERSITY

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE AWARD OF A MASTER OF ARTS IN SOCIAL SECTOR PLANNING AND MANAGEMENT OF MAKERERE UNIVERSITY

NOVEMBER 2019

DECLARATION

I, Nnamulondo Proscovia, declare that this dissertation is my original piece of work and has not been presented for any academic award of Makerere University or any other institution of higher learning. Where any other work is cited, it has been acknowledged.

Signed

Student: ---------- Date...17th Dec 2019

Nnamulondo Proscovia

APPROVAL

This dissertation has been submitted with the approval of the supervisor;

.....

Date Dec. 17, 2019

Dr. Firminus Mugumya

Department of Social Work and Social Administration,

Makerere University

DEDICATION

To my mother, Ms Josephine Bukirwa, my son, Keane Mark Akiza, my siblings and friends who believe in me and always encourage me to go for bigger opportunities even when I feel unprepared.

ACKNOWLEDGEMENTS

This thesis is a product of Divine Providence and the great friends God placed around me during my academic journey. I thank the Almighty for giving me the courage to enroll for this course, providing the resources I needed and helping me to remain committed to the end. Whenever the temptation to postpone tasks hovered over my head, a strong voice would remind me that I was not created to fail. I, therefore, feel so blessed to receive this achievement by God's Grace.

I wish to extend my sincere gratitude to my supervisor, Dr. Firminus Mugumya, who gave me invaluable guidance right from the formative stages of the proposal that led to this study. Dr. Mugumya, you are the light that showed me the way and kept me on track for the entire length of this journey. May God bless you abundantly!

I am highly indebted to my special friends who always wanted me to move to another level in life and believed in my capacity to achieve big things. The constant reminders from Ruth Nanyonga telling me to leave the comfort zone and search for opportunities challenged me to work harder and remain hopeful. The family of Tom and Sarah Ssemwogere was another invaluable blessing that surrounded me throughout the course. Thank you so much Ruth, Sarah and Tom for all the words of encouragement you volunteered at all times.

I thank God for the special team of ladies with whom I shared a lot as we undertook the course. We met as strangers but left the university as great friends. Thank you Rachael Nabukeera, Catherine Mbabazi, Erina Aituk and Ruth Musiime for all we shared during this academic journey.

Finally yet importantly, I thank my sister Ms Jane Kagabane who was always available whenever I needed all kinds of support, and my son, Mark who always asked for updates about my progress in this course.

I cannot mention everybody who touched my life and supported me to succeed in this course but I pray to the Almighty God who used you in different ways to always bless you abundantly.

ABBREVIATIONS/ACRONYMS

AE	-	Agricultural Extension
AEW	-	Agricultural Extension Worker
FAO	-	Food and Agricultural Organization
ICT	-	Information and Communication Technology
KII	-	Key Informant Interview
MAAIF	-	Ministry of Agriculture, Animal Industry and Fisheries
MFPED	-	Ministry of Finance, Planning and Economic Development
NAADS	-	National Agricultural Advisory Services
PMA	-	Plan for Modernization of Agriculture
UBOS	-	Uganda Bureau of Statistics
UNFFE	-	Uganda National Farmers' Federation
UPDF	-	Uganda People's Defence Forces

ABSTRACT

Since the colonial era, successive governments in Uganda have implemented policies and programs aimed at availing agricultural extension services countrywide. Key functions of agricultural extension include transmitting knowledge, information, skills and technologies, and facilitating interactions among actors in the agricultural sector for the cardinal purpose of improving farmers' welfare. Up to 54 percent of Uganda's rural households rely primarily on subsistence agriculture. Information is said to be powerful in terms of empowering people to achieve their full potential. This study aimed at establishing the perceived contribution of extension workers in meeting farmers' information needs in Busimbi sub-county, Mityana district. A cross-sectional mixed methods survey was carried out. Up to 380 subsistence farmers living in 21 villages were interviewed using a structured questionnaire. Seven agricultural extension workers based at Mityana district and Busimbi sub-county headquarters were interviewed using an interview guide. Qualitative data was analyzed by thematic categorization while quantitative data was analysed using Microsoft access and excel computer programmes.

Findings showed that the agricultural information needs of subsistence farmers concerned modern farming practices (62.1%), pests and disease control (52.4%), good seed varieties, fertilizer application, crop prices and financing opportunities. On average, only 24.4% of subsistence farmers perceived extension workers to be making a contribution in meeting their information needs. The socio-demographic factors found to influence farmer perceptions were gender, membership in farmers' groups, level of education, major source of income and level of income from agriculture. It was established that, the higher the level of education and income of a farmer, the more positive were the perceptions about the contribution of extension workers in meeting their information needs. Male subsistence farmers and members in farmers' groups exhibited positive perceptions about the contribution of extension workers. The major constraints hindering information flow between subsistence farmers and extension workers included lack of knowledge on how to access extension workers, long distances to the sub-county, absence of extension workers, and poor facilitation/low funding of extension services. There is need to increase the staffing levels and facilitation of extension workers as well as motivate farmers to work in groups. Socio-economic empowerment of farmers is critical to increase uptake of extension services.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 Introduction

This chapter gives the study background, problem statement, objectives of the study, research questions and the conceptual framework.

1.2 Study Background

Agricultural practice instructions were found in ancient Egypt, Mesopotamia and China dating more than 3,000 years ago (Uddin, 2008), but the kind of agricultural extension services being offered today is traced back to the 1840s and 1850s. This is the period when practical instructors were first sent to rural areas in the south and west of Ireland to support communities to recover from devastating effects of the potato blight disease, which had ravaged the countryside for about five years. After three years of work, the instructors had caused great improvements in the farming practices of large numbers of peasant farmers (Jonea and Rolls, 1982).

Impressive results of practical instructors in Ireland prompted other countries to organize their own system of mobile agricultural instructors. By the end of the 19th Century, the practice had spread to Denmark, Netherlands, Italy, and France (Uddin, 2008). The United Kingdom enacted laws which created a board of agriculture, promoted agricultural education, and made agricultural extension work part of the services provided by local government authorities. This provided a learning ground for the American continent, including Canada and the United States of America, which had a well-established system of agricultural extension work by the end of the 19th Century (FAO, 1997).

The term Agricultural Extension (AE) was adopted when the United States Federal Smith-Lever Act of 1914 formalized a nationwide cooperative federal-state-county programme. The Act gave the operational responsibility for agricultural extension to the land grant colleges and universities to aid in diffusing useful and practical agricultural information among the people (FAO, 1997).

Agricultural extension was introduced to the developing world by colonialists towards the end of the 19th Century, to improve production of tropical raw materials to feed industries in their home countries. This was supplemented by missionaries who undertook agricultural education with demonstration activities alongside their religious work (FAO, 1997).

In Africa, agricultural extension has been used under different models with minimal success in addressing the problems of rural poverty and food security (Kristina, 2004). For instance, in Uganda, the colonial regime used agricultural extension services to foster quicker adoption of new farming practices and crops through regulation and enforcement before shifting focus to farmer education (UNFFE, 2002). After independence, the government introduced policies that emphasised availing agricultural extension services countrywide. However, the period between 1966 and 1986 caused a sharp decline in services due to political instability.

In the 1990s, the Government of Uganda placed agricultural extension services under local governments to make information flow faster and efficient (MFPED, 2000). It later introduced the Plan for Modernization of Agriculture (PMA) and enacted the National Agricultural Advisory Services (NAADS) Act, 2001 with a mission to eradicate poverty by transforming subsistence to commercial agriculture, with emphasis on research and advisory services (UNFFE, 2002). By 2010, many districts had both traditional and NAADS extension workers. However, low production and productivity, low value addition to produce, and limited market access continued to challenge the agricultural sector (MAAIF, 2010). The annual growth rate of the sector fluctuated between 2.6 and 3.8 percent, below the 6 percent targeted by African governments under the Maputo Declaration of 2003 (MAAIF, 2010). In 2012, the Government placed NAADS under the Uganda People's Defence Forces (UPDF) in an arrangement code-named 'operation wealth creation' to speed up seed distribution.

In June 2014, the government introduced a Single Spine agricultural extension system spearheaded by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) whose objective was to harmonise and coordinate all extension service delivery in the country to address the inefficiencies associated with its predecessor systems (Barungi, Guloba and Adongo, 2016). This gave MAAIF mandate to coordinate agricultural extension services in the country through its three main directorates: crop, animal and fisheries resources with distinct departments under each directorate, which stream down to local governments (districts, sub counties and administrative parishes). At the local government level, extension falls under two departments: Natural Resources (environment, lands and forestry) and Production (agriculture, commercial services, fisheries, entomology and veterinary) (Buyinza, Sekatuba, Agaba, Kinuthia and Kiptot, 2015). District local governments have the mandate to recruit and appoint extension staff at

district and sub-county levels while the central government provides financing for salaries, inputs and facilitation for operations.

Nonetheless, up to 54 percent of Uganda's rural households rely primarily on subsistence agriculture (MFPED, 2014) characterized by dependency on family labour and production for household consumption amidst numerous constraints including lack of inputs, skills and knowledge, adverse weather conditions, lack of storage and processing facilities, among others (MFPED, 2000). These challenges directly relate to the key functions of agricultural extension services, which include transmitting knowledge, information, skills and technologies, and facilitating interactions among actors in the sector for the cardinal purpose of improving farmers' welfare (FAO, 2011; Gabriel, 1991; Purcell & Anderson, 1997).

This state of affairs begs the question of whether the services of agricultural extension workers particularly in information provision address the actual needs of subsistence farmers. Without effective information sharing between extension workers and farmers, Uganda's goal of integrating subsistence-orientated producers into the commercial economy may never be achieved. This study establishes the perceived contribution of agricultural extension workers in meeting information needs of subsistence farmers.

1.3 Problem statement

Uganda's agricultural sector offers great potential for poverty and inequality reduction. Within the policy and regulatory framework for improving agricultural productivity, there are extension workers at district and sub-county levels mandated to provide farmers with the information they need. Provision of information and advice to farmers is intended to enable farmers to transit from subsistence to commercial farming. Since 1990, the government of Uganda has undertaken numerous reforms to improve extension services provision in the country. However, performance of the agricultural sector has remained below the target. Low production and low productivity have continued to be major challenges in the agricultural sector. Some researchers have investigated weaknesses on the supply side of agricultural information such as inadequate facilitation and low staffing levels, which hinder smooth flow of information to farmers. This study engaged subsistence farmers to establish their perceptions about the contribution of extension workers in meeting their information needs.

1.4 Objectives of the study

1.4.1 General objective

This study sought to establish farmer perceptions about the contribution of agricultural extension workers in meeting their information needs.

1.4.2 Specific objectives

i. To find out the information needs of subsistence farmers in Busimbi sub-county;
ii. To establish the perceived usefulness of information subsistence farmers receive from extension workers;
iii. To identify the socio-demographic factors that influence perceptions of subsistence farmers about extension workers in meeting their information needs.
iv. To establish constraints faced by extension workers and subsistence farmers in exchanging information on agriculture.

1.5 Research questions

i. What are the agricultural information needs of subsistence farmers in Busimbi sub-county?

ii. What are the perceptions of subsistence farmers about the information they receive from agricultural extension workers?

iii. What factors influence perceptions of subsistence farmers about extension workers in meeting their information needs?

iv. What are the constraints facing agricultural extension workers and subsistence farmers in exchanging agricultural information?

1.6 Rationale for the study

Agriculture is the primary driver of economic growth and poverty reduction in Uganda (MAAIF, 2013). It employs more than 70% of the population (UBOS, 2016) and contributes over 20 percent to the Gross Domestic Product (UBOS, 2014). Unfortunately, its annual growth rate fluctuates between 2.6 and 3.8 percent below the 6 percent target (MAAIF, 2010). One of the key agricultural development interventions undertaken by the government is provision of extension services with a focus on research and advisory services to enable subsistence farmers to transit to commercial farming. This study provides a modest picture on how some of the

intended beneficiaries perceive agricultural extension workers in meeting their information needs.

1.7 Significance of the study

This study has policy significance for the development of Uganda as a country because of the comparative advantage of agriculture to the economy. This study brings out the information needs of subsistence farmers which extension workers should know to be able to effectively plan and implement information programs that may result into improved farm production and productivity, hence national development. The results may be used to inform the design of extension policies for the country.

This study is significant to extension practice because it provides some direct feedback to agricultural extension workers on how they are perceived by different categories of subsistence farmers whose information needs they are mandated to address. The information on constraints facing agricultural extension workers and subsistence farmers in the process of exchanging information may also guide strategies for sharing information in future agricultural programs. In addition, findings of this study may be used by extension workers in other sectors, such as health to inform their communication programs that target the rural poor, majority of whom are subsistence farmers.

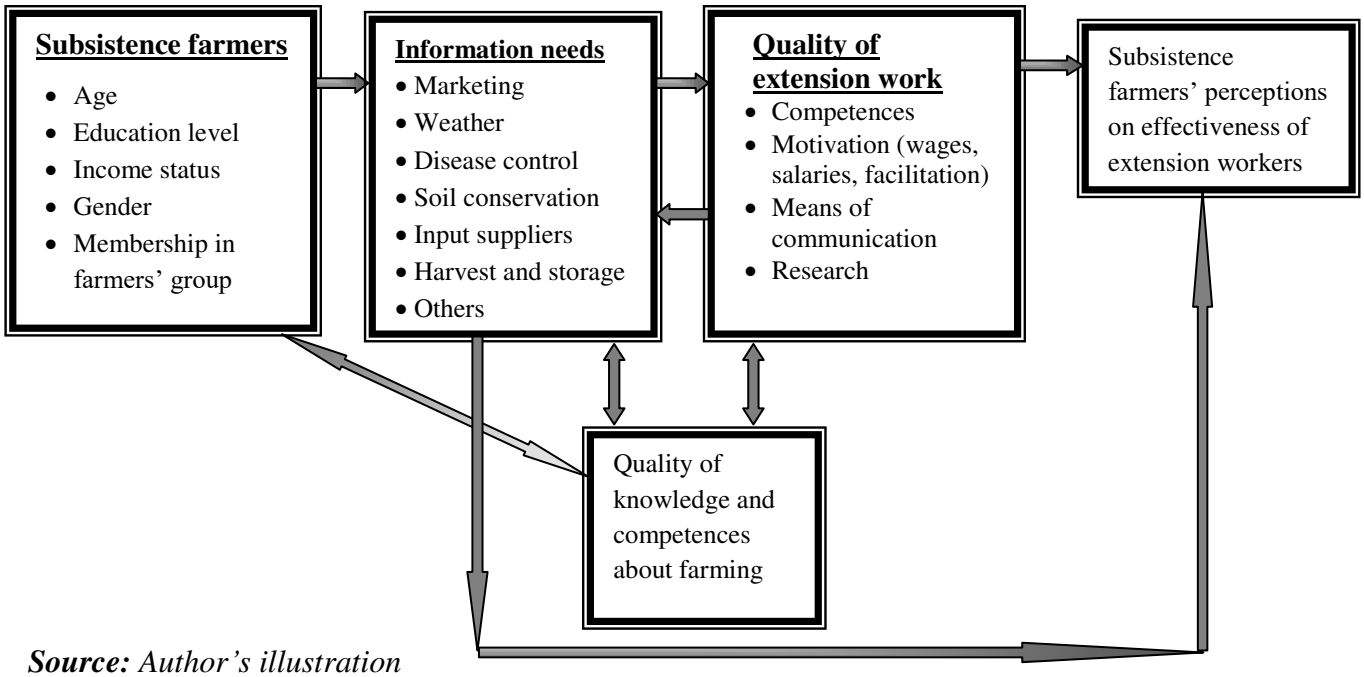
Lastly, findings of this study could inform future research particularly regarding improving the uptake of extension services by subsistence farmers. Apparently, there are many factors pertaining to the disposition of farmers, which should be investigated and addressed to enable subsistence farmers to search for information and utilize it. Another study could be conducted to analyze the actual interventions undertaken by extension workers in a bid to meet the information needs of farmers.

1.8 Conceptual framework

Subsistence farmers are primarily engaged in small-scale agricultural production. They have various information needs depending on their age, level of education, income levels, gender, membership in farmers' groups and their other socio-demographic characteristics. They need information related to obtaining agricultural inputs, weather, soil conservation, pests and disease control, harvest and storage of produce, marketing and other aspects of their trade. Extension

workers are expected to be the main source of information for farmers to improve production. They are government employees whose job description requires them to promote agricultural productivity by ensuring that farmers have the information they need to maximize farm yields. They are variously trained and facilitated to reach out to farmers using different means of communication, which may include interpersonal interactions and the mass media. Extension workers design messages to address the information needs of subsistence farmers. When subsistence farmers receive the messages, their level of knowledge is expected to improve, but this depends on the quality and capacity of the extension worker. With improved knowledge and competence levels, subsistence farmers develop positive perceptions about the contribution of extension workers hence regarding them as effective. Conversely, if subsistence farmers feel that the information from extension workers does not satisfy their needs, their perceptions about effectiveness of extension workers will be negative. In addition, if farmers are able to meet their information needs in other ways without having to rely on the services of extension workers, their perceptions about extension workers are likely to be negative. The quality of information and the extent to which it meets the needs of subsistence farmers shape their perceptions about the effectiveness of extension workers. This is further illustrated in figure 1.1 below.

Figure 1.1: Factors shaping perceptions of subsistence farmers about extension workers in meeting their information needs.



Source: *Author's illustration*

1.9 Operationalization of key terms

Conceptualization is the mental process by which fuzzy and imprecise concepts and their constituent components are defined in concrete and precise terms (Bhattacherjee, 2012). This is followed by operationalizing the terms to show exactly how they are measured in the context. Therefore, in this study, the key terms have been operationalized using reflective indicators as follows:

Perceptions: all feelings and opinions expressed by subsistence farmers about the work of agricultural extension workers in passing on information to them. These may be positive or negative. Terms used by respondents such as adequate, enough, good, satisfied, and affirmations of positive statements with 'yes' portray positive perceptions and the reverse is true for negative perceptions. The perceptions are interpreted against 10 reflective indicators, which include: 1) extension worker as a major source of information; 2) meeting the sub-county extension worker; 3) availability of information at the time of need; 4) relevance of information from extension workers; 5) satisfaction of needs with information from extension workers; 6) affordability of communication channels used by extension workers; 7) accessibility of communication channels used by extension workers; 8) language used by extension workers; 9) duration of time extension workers dedicate to giving information; and 10) the time of day extension workers disseminate information. In the results, perceptions are interpreted either as positive or negative depending a percentage score of respondents per indicator.

Information: This includes oral, written and audio-visual messages and advice agricultural extension workers pass on to farmers.

Communication channels: all avenues including interpersonal, mass media, and modern information and communication technology (ICT) tools used by extension workers to disseminate information to farmers.

Subsistence farmers: residents engaged in small-scale agriculture primarily for food production and basic livelihood for their families.

Agricultural extension workers: civil servants employed by the government at district and sub-county level to give technical and professional support to people engaged in agriculture.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter gives a review of literature about information needs and major sources of agricultural information for farmers, perceptions on the contribution of agricultural extension workers in meeting farmers' information needs, and channels of communication used. It looks at findings of other scholars and researchers on constraints hindering the flow of information between extension workers and farmers, and recommendations for improvement. It ends with a summary of key issues in the literature and gaps identified to warrant this study.

2.2 Information needs of farmers

The term information need was defined by Atkin (1973) as 'a function of extrinsic uncertainty produced by a perceived discrepancy between the individual's current level of certainty about important environmental objects and a criterion state that he seeks to achieve'. Simply stated, an information need is the gap between the information an individual possesses and the level of knowledge or awareness he/she aspires to achieve.

There is consensus that farmers need information to be able to improve agriculture (Ahmed and Muhammad, 2015), but there are slight differences in the type of information needed and how often it is needed. A study conducted by Meitei and Devi (2009) in Manipur India revealed that 46.67 percent of farmers needed information regularly, 38.18 percent needed information sometimes while only 15.15 percent did not need information at all. In Bangladesh, Bhagachand (2012) found out that 40.58 percent of the farmer community in rural areas required daily information for various kinds of agricultural work.

Understanding information needs of farmers is critical in designing programs for farmer groups (Babu, Glendenning, Asenso-Okyere, and Govindarajan, 2011). Meitei and Devi (2009) classified information needed by rural farmers into six groups: 1) Field/land acquisition; 2) Agricultural inputs (seed varieties, pesticides, equipment, weather conditions, harvest); 3) Agricultural technology (innovative technology); 4) Agricultural credit; 5) Agricultural marketing; and 6) Food technology (post harvest/value addition technology).

Numerous studies have been conducted on the information needs of farmers in different settings (Babu, Glendenning, Asenso-Okyere & Govindarajan, 2011, Bhagachand, 2012, Lwoga, Stilwell and Ngulube, 2011, Meitei & Devi, 2009, Ozowa, 1997, Tumsifu and Silayo, 2013). One country where farmers' information needs have been widely studied is India. Using a case study of two districts in South India, Suresh, Kwadwo and Senthil (2011) found out that important information needs related to rice growing included pest and disease management, pesticide and fertilizer application, seed variety, and seed treatment. Similar findings were obtained in Meghalaya and Sikkim (Singh, 1990) and Manipur State (Meitei and Devi, 2009) although with additional needs for information on equipment, weather conditions, irrigation, harvest, and post harvest technology. Non-crop information needed regarded subsidies and credit information (Babu, Glendenning, Asenso-Okyere, and Govindarajan, 2011). However, in their assessment of information needs of farmers in Tamil Nadu, Babu, Glendenning, Asenso-Okyere, and Govindarajan (2011) found out that information on post-harvest aspects (grading, storage, consumer behavior, transport and distribution) was given lowest importance.

Kazi (2012) carried out a sector-wide review of the role of information for rural development in Bangladesh and found out that farmers needed 'a constant flow of information on modern technology, seed selection and quality assurance, various cropping systems and cultivation processes, agricultural insects and diseases, symptom and disease identification, treatment, and choice of remedy'. Information was also needed on 'fertilizer application, irrigation requirements by crop, soil and season, irrigation input, market information, prices, government support, flood forecasts and control, commercial agriculture, contract farming, support institutions, crop processing, and pest control'.

However, despite the uniformity in the types of information needed by farmers, studies done in Tanzania show that information needs are not static but change over time (Lwoga, Stilwell, and Ngulube, 2011, Tumsifu and Silayo, 2013). For instance, different wards in Iringa district of Tanzania had different needs on crop and livestock husbandry as well as value addition (Tumsifu and Silayo, 2013). Another study conducted in the same country two years earlier demonstrated that the knowledge and information needs, and information seeking patterns of farmers were location specific due to slight variations in development levels, agricultural activities and agro-ecological conditions in the surveyed communities (Lwoga, Stilwell, and Ngulube, 2011). This

indicates that farmers in a given location need information specifically designed to meet their needs. Information designed for one area may not be applicable to another. In addition, Babu, Glendenning, Asenso-Okyere, and Govindarajan (2011) assert that farmers are not a homogeneous group, hence the need to understand their information sources, access and use in order to target extension and advisory services better.

It is evident that farmers need agricultural information but their needs are numerous, diverse, location specific and not static, which means that information targeting them must be customized to meet their unique needs. In addition, farmers themselves are not homogenous but their information needs largely fall in six groups: agricultural field/ land acquisition, inputs, technology, credit facilities, marketing, and post harvest handling. Literature further shows that most farmers routinely need information. This study seeks to establish the information needs of subsistence farmers in Busimbi sub-county since literature indicates that farmers in every location have unique needs dictated by variations in their environment.

2.3 Sources of agricultural information for subsistence farmers

Agricultural extension workers occupy a prominent place among sources of information for farmers. In Bangladesh, the preferred sources of information for farmers were their colleagues or fellow farmers followed by newspapers and government officials (Bhagachand, 2012). In this case, government officials included extension workers. In India, Babu, Glendenning, Asenso-Okyere and Govindarajan (2011), Bhagat, Nain and Narda (2004), Suresh, Kwadwo and Senthil (2011), found out that private input dealers, contact farmers and the state agricultural extension staff were the main information sources particularly among small-scale farmers.

In Tanzania, Lwoga, Stilwell and Ngulube (2011) established that neighbours and friends were the main sources of agricultural information and knowledge to 72.9% of the local communities, followed by public extension officers at 71.8%. In Kenya, between 40 and 70 percent of farmers reported government extension as an important source of information (Rees et al, 2000). However, both farmers and extension personnel themselves expressed dissatisfaction with the quality and frequency of their interactions (Rees et al, 2000).

All these studies show the important position agricultural extension workers occupy as an important source of information to farmers in rural areas but following family members, neighbours, contact farmers, and input suppliers. However, the evidence in the literature is obtained from studies done in other countries whose socio-economic and political environment may be different from that of Uganda. This study investigated the place of agricultural extension workers as an information source for rural subsistence farmers in a Ugandan setting.

2.4 Perceptions about the contribution of agricultural extension workers in meeting farmers' information needs

Agbarevo and Machiadikwe (2013) considered extension effectiveness to be the arithmetic average of nine indicators which include: 1)the level of awareness of extension services created among farmers; 2)number of visits paid by the village extension worker; 3)percentage of scheduled meetings held between farmers and extension workers; 4)number of field meetings held; 5) regularity of meetings held by village extension worker; 6)number of field days organized by village extension worker; 7) number of demonstrations organized by the village extension worker within a specified time frame; 8) number of supervisory visits; and 9) number and regularity of research-extension linkage workshops and farmer training sessions/farmers trained. This shows that the contribution of agricultural extension is largely measured in terms of the level of interactions between extension workers and farmers. This study focused on how subsistence farmers perceived the information shared with them by extension workers through all kinds of interactions and channels and it in relation to meeting their information needs.

The concept of client satisfaction in agricultural extension was defined by Khalil, Ismail, Suandi and Silong (2008) as 'the way a customer feels about the agriculture extension program on scales that range from very satisfied to very dissatisfied'. Four researchers studied the influence of extension leadership competencies and organisational commitment on extension workers' performance in Yemen and concluded that a good performance can be achieved through appropriate agriculture extension policies and strategies. They recommended that to improve the performance of agricultural extension workers, the ministry of agriculture needed take into account the status of extension workers specifically on their competencies, skills and job commitment to work with the rural communities (Khalil, Ismail, Suandi and Silong, 2008).

Lawal, Oladokun and Kalusopa (2015) share similar findings in their investigation of the role of extension workers in Akis Based Irrigation Farming in Katsina State of Nigeria. They concluded that an efficient, dedicated, adequately trained and well oriented extension worker is essential for maintaining a healthy, productive channel of communication and change between research output and the farming community. On the usefulness of the information obtained and disseminated, extension workers indicated that it was useful because majority of the irrigation farmers frequently requested for it from them. On whether irrigation farmers were satisfied with the information the extension workers delivered to them, all respondents (100%) answered in the affirmative. The researchers noted that it was human for extension workers to rank satisfaction of farmers highly because 'no one will admit that his clients were not satisfied with his activity'. They concluded that the little information disseminated by extension workers was useful to the farmers but more needed to be delivered (Lawal, Oladokun, Kalusopa, 2015). In the Suwannee valley of North Central Florida, at least 87 percent of respondents trusted the information given by extension agents regarding best management practices (Britton, 2011). Britton (2011) noted that the effectiveness of an extension agent can affect a farmer's decision to adopt best management practices.

Other studies reveal that extension workers do not contribute to meeting information needs of farmers. For instance, there is sometimes a disjuncture between the information needs of farmers and the information provided by the research and education sector (IICD, 2003). Margomo and Sugimoto (2011) indicated that there was ineffectiveness of agricultural extension service in disseminating useful information to farmers.

The above literature indicates that different studies have yielded mixed results on effectiveness of agricultural extension workers in meeting farmers' needs. This study goes beyond measuring satisfaction with interactions and information from extension workers to examine the relationship between socio-demographic characteristics of subsistence farmers and their perceptions about extension workers.

2.5 Communication channels used by extension workers to disseminate information to subsistence farmers

The supply and demand sides of agricultural information converge through various interpersonal and mass means of communication. While agricultural extension may have many approaches and methods at its disposal, farmers also have varied preferences and capacities regarding utilization of different communication channels (Anderson and Feder, 2004). Kumar (2011) observed that the way information is communicated about an innovation is very important.

According to Kaul (2011), 'if development communication must succeed, it should not stop with conventional mass media but must include strong components of social organization and interpersonal as well as traditional modes and media'. Kaul (2011) recommended an integrated approach to avoid limitations and problems as well as take advantage of potentials of all modes of communication. It is necessary that both mass media and interpersonal communication infrastructures are accessible to the people, both physically and socially (Kumar, 2011). The combination of participatory techniques, indigenous communication channels and ICTs can improve the sharing and adoption of agricultural technologies in the local communities (Chapman, Kranjac-Berisavljevic, and Zakariah, 2003).

Key channels of communication in agriculture include farmer interactions, farmers' associations, extension workers, on-farm demonstration, meetings, training workshops, ICT especially cell-phones, and mass media (radio and television) (Narayana, 2013, Lawal, Oladokun and Kalusopa, 2015). However, it is easier for farmers to apply information and knowledge received through interpersonal channels than ICTs (Lwoga, Stilwell and Ngulube, 2011). Utilization of ICT tools (internet and email) is limited by low literacy levels of farmers, cost of purchase of ICT tools, and lack of knowledge on how to use the ICT tools (Lawal, Oladokun and Kalusopa, 2015, Lwoga, Stilwell and Ngulube, 2011). In progressive communities, majority of the farmers use radio as the most common information channel followed by television and newspapers in local and regional languages (Meitei and Devi, 2009, Halakatti, Gowda, Natikar, 2010). However, the impact of television is limited by lack of electricity in rural areas while print materials have low use due to their unavailability and the absence of the reading culture (Lwoga, Stilwell and Ngulube, 2011, Babu, Glendenning, Asenso-Okyere, and Govindarajan, 2011). Galadima (2014)

recommended that, government should provide relevant infrastructure particularly sources of energy to enhance the usage of the visual media.

These findings show that oral communication channels are effective ways of delivering information and knowledge in the surveyed local communities to a greater extent than ICTs. This study evaluates the affordability and accessibility of channels used by extension workers to subsistence farmers in the study area.

2.6 Constraints faced by extension workers and subsistence farmers in exchanging information on agriculture

A number of constraints face both farmers and extension workers in the process of exchanging information. These may be personal, emotional, educational, demographic, social/interpersonal, environmental, economic, and source characteristics.

FAO (2011) identified socio-cultural factors as leading constraints to the effectiveness of extension in many countries. These include language differences, illiteracy, resource endowments, limited access to mass media such as publications, radios, or television which reduce the options available to extension for communicating its messages. Attitudes, interests and morale of media managers also affect the flow of extension messages to farmers.

Extension workers are hindered from interacting face-to-face with farmers by long physical distances and lack of transportation facilities coupled with lack of political commitment (Margono and Sugimoto, 2011, Purcell and Anderson, 1997). Most African governments treat information delivery as a matter of choice and agricultural information is not often integrated with other development programs to address the numerous related problems that face farmers (Ozowa, 2007). Other problems include insufficient funding at state level, inadequate or non-availability of inputs, poor logistic support and inadequate staffing (Bell and Obinne, 2012, Lawal, Oladokun, Kalusopa, 2015, Ozor, 2010, Saliu1, Obinne and Audu, 2009). Unavailability of funds disrupts the free flow of extension information to farmers. This shows that extension services including information dissemination cannot be effectively performed without the required funding.

There are also problems emanating from inadequate consultation of farmers about their information needs and poor understanding of their information search strategies, which is exacerbated by poor reliability and timeliness of information (Suresh, Kwadwo and Senthil, 2011). In some areas, extension workers are inadequate, ill equipped and ill trained (Lawal, Oladokun and Kalusopa, 2015). Interface between and among extension, research and education remains a critical area of concern to increase the efficiency of extension services (Halinl and Kaida, 2002, Lawal, Oladokun and Kalusopa, 2015)

On the other hand, farmers face constraints such as lack of means and facilities by which information can be easily accessed, irrelevant information, delays in information delivery, extension workers' personalities, and lack of feedback mechanisms (Galadima, 2014, Siyao, 2012). Through a contingent valuation technique, it was found that farmers' willingness to pay for voice-based mobile phone messages was low (Suresh, Kwadwo and Senthil, 2011).

Extension workers are advised to be more committed to their duties, more approachable and improve their feedback mechanisms (Galadima, 2014). Lawal, Oladokun and Kalusopa (2015) recommended that extension workers should be provided with transport, allowances, and cell-phones to deliver extension messages in time. Siyao (2012) recommended that the provision of agricultural information to rural farmers should be gender sensitive.

The literature reviewed shows a number of constraints that face extension workers and farmers in exchanging agricultural information. However, most studies focused on the general constraints facing extension workers and farmers. This study focused on those constraints hindering information flow between agricultural extension workers and subsistence farmers.

2.7 Improving information sharing between extension workers and subsistence farmers

Tom (1991) identified a number of communication opportunities and tools at community level which include gossip networks, village meetings, religious events, drama, dance, and singing. He observed that 'indigenous methods of communication are important for extension agents to understand because they could represent a new extension resource for conveying messages, imparting information or strengthening motivation locally' (Tom, 1991).

Uganda's Poverty Eradication Action Plan (MFPED, 2000) indicated that it was important to integrate different kinds of communication approaches to achieve goals of the program. The following information dissemination opportunities were suggested: information centres; civil society institutions such as churches, mosques and NGOs, theatre for development, and private communication companies.

Communication can only work efficiently with the co-participation of farmers (FAO, 2011). Incentive systems have to be developed to reward staff (extension workers) for being in the field and working closely with farmers (Alemu and Demese, 2005). ICT can be combined with the other extension methods for making extension more effective (Birner and Anderson, 2007). Though farmers largely use old means, the modern communications means have the potential of being better sources, should the information producers upload relevant and context-specific information (Tumsifu and Silayo, 2013). Cell-phones can be used to provide access to agricultural market information, and it can also be used to answer other questions regarding farming (Tumsifu and Silayo, 2013). ICT facilities aid the retrieval and dissemination of agricultural knowledge and information in a more secure, faster and acceptable format Lawal, Oladokun, Kalusopa (2015).

The foregoing literature enumerates a number of avenues for improving information flow between extension workers and farmers. This study finds out the practical ways to improve communication between subsistence farmers and extension workers in a Ugandan context.

2.8 Conclusion

Literature on the subject of communication between agricultural extension workers and subsistence farmers agrees that farmers regularly need information to meet their needs which are diverse, dynamic and location specific. It is clear that agricultural extension workers provide a key source of information to farmers but there are diverging views on their level of effectiveness, which is largely determined by their personal attributes and context in which they work. Challenges such as lack of policy support, inadequate funding and low staffing levels lead to poor reliability and timeliness of information, hence ineffective information flow. The new source of hope is that modern media such as ICT (internet, email and cell-phones) and other

traditional media provide opportunities for improved information sharing between and among extension workers and farmers.

However, most studies have been carried out in Asian and West African countries. There is limited literature on the situation in Uganda. This study investigates farmer perceptions about the contribution of extension workers in meeting their information needs in a Ugandan setting, focusing on the level of interaction, challenges faced and existing opportunities for improvement.

It is also evident that most studies carried out in this area focused on the general population of farmers or those specializing in particular agricultural enterprises such as rice growers and animal keepers. This study is unique because it focuses on subsistence farmers whose transition to commercial farming is the ultimate desire of the government of Uganda.

Further, there were limited attempts by previous researchers to examine both the supply and demand side of agricultural information. Most studies either focused on farmers alone or extension workers without marrying the views of the two subjects. In this study, data was collected from both subsistence farmers and extension workers to get a comprehensive picture of the information sharing process between them. In addition, this study explores the influence of socio-demographic characteristics of subsistence farmers on their perceptions about agricultural extension workers in meeting their information needs.

CHAPTER THREE : STUDY METHODOLOGY

3.1 Introduction

This chapter focuses on the design of the study, the study area and population, sampling procedure, sample size, data collection and analysis methods, and ethical considerations. It gives justification for every choice made in the methodology for purposes of improving validity and reliability of results. It also presents the researcher's personal orientation on the subject of communication and the measures taken to avoid influencing the study results. It ends with the challenges and limitations of the study.

3.2 Research design

A cross-sectional mixed methods research design was used to assess the perceived contribution of extension workers in meeting information needs of subsistence farmers. A cross sectional survey was selected because it allows measurement of independent and dependent variables at the same point in time (Bhattacherjee, 2012). This allowed capturing perceptions from a random sample of farmers in field settings using structured interviews. In addition, the survey method enables collection of data about people's preferences, thoughts and behaviours in a systematic manner. Further, the fact that data is collected from a field setting increases external validity of findings. Nonetheless, surveys are subject to respondent bias if the respondent is not adequately knowledgeable about the topic of study. There are also weaknesses stemming from sampling, social desirability and recall bias (Bhattacherjee, 2012). The researcher exercised a high degree of objectivity and an elaborate sampling procedure to ensure that interests of respondents or other actors within the environment did not interfere with the study process.

Mixed methods were used to generate a deeper insight into the relationship between extension workers and farmers concerning information sharing. Bhattacherjee (2012) asserts that regardless of the specific research design chosen, the researcher should strive to collect quantitative and qualitative data using a combination of techniques. Using multiple methods to collect different kinds of data enhances the relevance and reliability of results (Bhattacherjee, 2012). Babbie (2007) adds that combining qualitative and quantitative components makes both statistical comparisons and in-depth understanding of a study phenomenon possible.

3.3 Study area

This study was conducted in Busimbi Sub-county, Mityana District. The sub-county lies in the centre of Mityana District in the central region of Uganda, about 73km west of Kampala city. It has 10 administrative parishes and 106 villages. It skirts around Mityana Town Council while it is surrounded by Bulera, Ssekanyonyi, Malangala, Butayunja and Maanyi sub-counties. Its eastern border touches Lake Wamala and Mubende district. By the time of the study, Mityana Town Council had been granted municipal status and Busimbi sub-county was set to be divided into two divisions to be added to the municipality. This study considered the area originally covered by Busimbi sub-county.

Results of the 2014 National Population and Housing Census indicated that the total population of Busimbi Sub-county was 48,660 people (24,073 males and 24,587 females) living in 11,614 households. The average household size was 4.1 (UBOS, 2014). At least 85 percent of the population derived their livelihood from agriculture while 65 percent were directly involved in different agricultural practices (Mityana District, 2010). However, there were no statistics on levels of agricultural production in the sub-county.

The sub-county is endowed with fertile soils on its undulating hills and in the valleys. Some valleys have small streams of water which flow into Lake Wamala. This fresh water lake is a source of income for a sizeable proportion of the fishing community in the sub-county. It is the major source of fish sold in Mityana Town Council.

Busimbi has favourable climatic conditions with medium annual temperatures ranging from 17.2 to 29 degrees centigrade and enjoys two rainy seasons a year distributed from March-April and September-November. Such climate is ideal for crop production (Mityana District, 2010). The annual rains measuring 93mm are usually enough to sustain crop growing without any application of irrigation water. This enables both subsistence and other farmers to thrive in the area.

Busimbi is one of the sub-counties where agricultural extension services have been provided for a long period of time. The sub-county is also a beneficiary of the NAADS program since 2006. The people of Busimbi grow food and cash crops, keep livestock for domestic consumption and sale, while a few are involved in forestry and fishing. The major crops grown in the area include

maize, oranges, mangoes, beans, bananas and coffee. The common livestock kept include cows, goats, pigs and poultry (Busimbi sub-county, 2010).

The major constraints facing agriculture in the area are low prices, limited markets, poor road network, high market dues and limited extension services. The area sometimes experiences food insecurity which is blamed on poor farming methods and laziness of residents, pests, climatic changes, high disease prevalence among crops, animals and human beings (Mityana District, 2010).

Busimbi sub-county is representative of a typical agricultural community that receives agricultural extension services but it is not known whether the information provided satisfies the needs of subsistence farmers. The researcher anticipated that Busimbi sub-county would provide a good case study for investigating the perceived contribution of extension workers in meeting information needs of farmers.

3.4 Scope of the study

The study was carried out in all the 10 administrative parishes of Busimbi sub-county which include Busuubizi, Kabule, Kabuwambo, Katakala, Kireku, Naama, Nakaseeta, Nakibanga, Ttamu and Tanda. Data was collected in February 2017. This was a cross sectional study and the information gathered was expected to give a true representation of the situation at the time. The context scope of this study was limited to the flow of information between extension workers and subsistence farmers for purposes of meeting the information needs of the later.

3.5 Study population

The study population comprised two groups: subsistence farmers and agricultural extension workers. Subsistence farmers were selected as the main focus of this study because they constituted the biggest proportion of the farming population in the sub-county and in Uganda at large. In addition, subsistence farmers offer margins of progress that are much higher than those of other categories of farmers for the same level of investment (NEPAD, 2013). The population of farmers in Busimbi sub-county aged 15 years and above is 23,556 with 15,076 (64 percent) being subsistence farmers (Busimbi sub-county, 2010). Subsistence farmers were sometimes referred to as food security farmers because their main objective in agricultural work is to have enough food for home consumption to avoid famine. According to the District NAADS report

for 2014, enterprises promoted by extension workers for food security farmers in the sub-county were mainly beans, Irish potatoes, maize and bananas. Some subsistence farmers intercropped beans with coffee so that after harvesting, coffee would remain for future income generation.

Most of the agricultural activities of subsistence farmers rely on natural conditions particularly the two rainy seasons experienced per year in March-June and September-November. Harvesting normally takes place during the dry seasons in June and January. Marketing of the surplus of their agricultural produce is usually done by the individuals either to middlemen or final consumers. Some subsistence farmers living near trading centres vend their surplus produce to raise money for other basic needs.

The second category of respondents were agricultural extension workers. All agricultural extension workers based at Busimbi sub-county and Mityana district headquarters were targeted for the study. Agricultural extension workers are primarily responsible for transferring advice, knowledge and information to farmers, and facilitating farmers to define their problems and identify solutions together. They are expected to provide farmers with the tools and knowledge they need to adopt new sustainable methods of farming in order to improve their yields and mitigate climatic shocks.

3.5 Sampling procedure and sample size

Sampling is the process of selecting units such as people from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (Bhattacherjee, 2012). Different sampling methods were used to arrive at the number of respondents in the two categories. Probability sampling which is a technique in which every unit in the population has a chance of being selected in the sample was used to select respondents. Probability sampling makes it possible to accurately determine the chance for a unit to be selected.

All the seven extension workers based at district level and in the study area were selected for interviews because their population was less than ten (Krejcie and Morgan, 1970). A sample of subsistence farmers was selected from their population of 15,076 people using the table by Krejcie and Morgan (1970). The table was constructed using the formula below:

$s = X^2 NP(1-P) \div d^2(N-1) + X^2 P(1-P)$

Where

s = required sample size.

*X*2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Therefore;

The estimated total number of subsistence farmers in 10 administrative parishes in Busimbi sub – county was 15,076 and the corresponding sample size given by the sampling table was 378 people at a confidence level of 95% and a margin of error of 0.05%.

Table 1: Sample size of respondents

Category of Population	Pop. Size	Sample Size	Sampling Technique
Agricultural Extension workers	7	7	All
Subsistence farmers	15,076	378	Simple random sampling

3.5.1 Sampling frame and method

A list of all administrative parishes and villages in Busimbi sub-county was obtained from the sub-county chief as the sampling frame for villages. Two villages were selected from each parish using simple random sampling to get a total of 20 villages. Names of all villages of each parish were written on pieces of paper of the same size, folded and put together in a tin and tossed to pick out only two. Simple random sampling helped the researcher to ensure that every village in the sub-county had a chance of being selected for study hence eliminating bias. The sample size of subsistence farmers was then divided equally among the 20 villages. Thus,

Total sample of subsistence farmers = 378

Total number of villages = 20

Therefore: 378 ÷ 20 = 18.9

Since there was no way to get 0.9 person, the figure was rounded off from 18.9 to 19 subsistence farmers per village. This gave a total of 380 subsistence farmers, which number was close to the sample size given by the sampling table. Selection of the 380 farmers was done using convenience sampling depending on their availability at the time of the visit to their villages and willingness to participate in the study. These were found in their homes or gardens. Village chairpersons helped to identify commercial and semi commercial farmers in their villages so that they could be excluded from the study.

However, during the study one more village was added to the sample after failing to get the required number of respondents in one of the selected villages. This was because the originally selected village was partly a trading centre with a small population of farmers. The additional village was selected through convenience sampling because it was neighbouring the one originally selected. This brought the total number of villages visited during the study to 21.

Table 2: Number of respondents selected per parish and village

Parish	**Village**	**Frequency**	**Percentage**
Ttamu	Ginzi	19	5
	Kitinkokola A	19	5
Naama	Nalugazi	19	5
	Naama Central	19	5
Ttanda	Nakanyenya	19	5
	Kisiita	19	5
Busuubizi	Kambuzi	19	5
	Busuubizi	10	2.6
	Mbaale	9	2.4
Kabuwambo	Lulere	19	5
	Kirima	19	5
Katakala	Kansuleeti	19	5
	Namamonde	19	5
Nakaseeta	Ddanya	19	5
	Kakunkwe	19	5
Kireku	Kitemambazi	19	5

	Namajiri	19	5
Kabule	Seeta-Buwunda	19	5
	Miggo	19	5
Nakibanga	Nakibanga B	19	5
	Kiweereza	19	5
Total		**380**	**100**

3.6 Methods of data collection

Mixed methods of data collection were utilised. Data collection tools were developed basing on the study objectives. Data was collected through structured interviews using questionnaires, and Key Informant Interviews (KIIs) using an unstructured interview guide.

3.6.1 Structured interviews

Individual structured interviews were conducted to obtain information from subsistence farmers. Interviews were selected because they allow respondents to express their opinions and substantiate them. Trained research assistants administered questionnaires to subsistence farmers within their homes in face-to-face interactions. Interviews with subsistence farmers were conducted in the local language (*Luganda*) which is widely spoken in the area.

Questionnaires mainly contained close-ended questions for statistical data generation and a few open-ended questions intended to obtain original ideas from respondents. The structured section of the questionnaire solicited for socio-demographic data and other statistics.

3.6.2 Key informant interviews

Seven extension workers based at district and sub-county headquarters were interviewed by the researcher in face to face interviews held in their offices, other public places convenient to them or via telephone, which helped to guarantee a high response rate (Babbie, 2007). An interview guide containing open-ended questions was used to obtain information from extension workers. The interviews were conducted in English. Permission was sought from respondents to audio record the interview proceedings, which were later transcribed.

3.7 Data processing and analysis

Both qualitative and quantitative data was collected and entered into different data entry computer screens and cleaned. Qualitative data was analyzed by thematic categorization while quantitative data was analysed using Microsoft access and excel programmes. Data was then analysed based on the corresponding objectives of the study (Tesfaye, 2013). All descriptions and analyses of the study were based on the data collected.

3.8 Reflexivity and position of the researcher within the Study

Reflexivity served as the procedure that guided this study. Reflexivity covers a continual procedure of reflection by the researcher on own values, presumptions, and behaviour of the research participants which could affect the interpretation of responses (Babbie, 2007).

As a mass communication student at undergraduate level, the researcher came across the concept of communication for development and developed a desire to study more about the subject. Communication in agriculture is classified as communication for development, which is the planned and participatory use of communication methods and tools that facilitate the sharing of knowledge and information, participation and change of attitude and practices aiming at achieving development goals agreed among all stakeholders (FAO, 2011). During the past ten years of her work in communication preceding the study, she came into close contact with both farmers at different levels and implementers of government programs including agricultural extension workers. The question of whether the two parties communicated meaningfully always bothered her, hence the choice of the study topic. Despite her predisposition, necessary rigour was ensured in order to obtain reliable and valid results. The researcher worked with four research assistants (two males and two females) to ensure objectivity. Quantitative data collected using structured questions was interpreted using computer software so that it is independent of the researcher's opinions.

3.9 Ethical considerations

For the study to yield valid findings, the researcher adhered to social research ethics. Kumar (2011) defines research as a complex set of values, standards and institutional schemes that help constitute and regulate scientific activity'. Ethical standards are important in research so that norms of scientific conduct are not violated at any one stage of the study (Bhattacherjee, 2012).

Therefore, research ethics help to check the biases and excesses of the researcher so that a high degree of integrity is upheld. The following ethical principles were considered:

3.9.1 Anonymity and confidentiality

The major ethical issue in this study concerned the privacy of respondents particularly subsistence farmers who could give sensitive information about particular extension workers. The researcher ensured that names of subsistence farmers were not captured anywhere in the research instruments and report to protect their privacy. They were informed in advance that their identity would not be required. They were also informed that the information they were going to give would be used only for academic purposes.

3.9.2 Informed consent

All data collection instruments had an introductory section which was used to explain to respondents the purpose of the study and why they were selected as participants. They were informed that they had a right to accept or decline to be interviewed. They were further informed that they had the right to leave questions unanswered, and could withdraw from the interview at any time if they felt uncomfortable.

3.9.3 References

All works of other scholars cited in this study are acknowledged in the text and in full references at the end of the document. Sincere efforts were made to avoid taking credit for other people's works.

3.10 Challenges faced

A number of challenges were faced. As anticipated, some villages selected using simple random sampling were remote and not easy to access. Fortunately, the study was conducted during the dry season and motorcycle transport was used to access those areas. Nevertheless, the cost of reaching the remote areas was high.

Secondly, the study was conducted at a time when the sub-county was in transition from being a rural local government unit to an urban unit after the creation of Mityana Municipality. The sub-county was being divided into two to create divisions for the new municipality. Both extension

workers and subsistence farmers were anticipating changes in the type of agriculture that would be allowed in a municipal setting.

In addition, the study was conducted at a time when agricultural extension workers under the NAADS program had been laid off and the process of recruiting new extension staff was ongoing. Therefore, only one extension staff at sub-county level was interviewed and the rest were heads of sections in the production department at district level.

3.11 Study limitations

A key limitation to this study is that it did not explore the role of subsistence farmers in searching and receiving information from agricultural extension workers. It assumed that subsistence farmers were in perfect conditions to receive information disseminated by extension workers without any limitations. It is likely that some subsistence farmers might not have responded objectively to the questions on the performance of extension workers.

Another limitation was that the study did not consider real situations such as a case study where information was generated by extension workers and disseminated to subsistence farmers. Extension workers were not tasked to point out real cases of information dissemination, which could be referred to during interviews with subsistence farmers.

In addition, this study did not qualitatively analyse the socio-demographic and other factors influencing perceptions of subsistence farmers about extension workers. A purely qualitative study could descriptively bring out such factors in a more comprehensive perspective.

CHAPTER FOUR: PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter is a presentation of an analysis and discussion of key findings of the study obtained from interviews with subsistence farmers and agricultural extension workers. The findings are presented in five sections as follows: Socio-demographic profiles of subsistence farmers and extension workers; Information needs of subsistence farmers; Perceptions of subsistence farmers about extension workers in meeting their information needs; Influence of socio-demographic characteristics of subsistence farmers on their perceptions about extension workers; and Constraints faced by subsistence farmers and extension workers in exchanging information, and suggestions for improvement.

4.2 Profiles of respondents

4.2.1 Socio-demographic profiles of subsistence farmers

Personal factors such as age, education, family size, land size and livestock ownership can affect farmers' satisfaction with the agricultural extension services (Elias, Nohmi, Yasunobu, and Ishida, 2015). This study sought to establish a number of socio-demographic characteristics of subsistence farmers, which could influence their perceptions about the contribution of agricultural extension workers in meeting their information needs.

A total of 380 subsistence farmers living in the study area were interviewed. Results in table 3 show that more than half (54.7%) of them were female and the rest (45.3%) were male. Majority (78.9%) of them engaged in mixed farming, which combines crop growing and livestock keeping. This is higher than the national average (66.9%) of mixed farmers reported in the national population and housing census (UBOS, 2014). A small number engaged in either crop growing (16.3%) or livestock keeping including poultry (4.5%) only. Only one respondent (0.3%) engaged in fishing and was male. Slightly more than half (50.5) of subsistence farmers interviewed had practiced agriculture for over 10 years. Others had spent six to 10 years (32.6%), three to five years (13.4%) and one to two years (3.4%) practising farming. The high number of respondents who had practiced farming for more than ten years contributed to reliability of the information obtained from them since agriculture is largely their way of life. Less than a quarter of subsistence farmers (23.4%) were members of farmers' groups while the rest (76.6%) were not. This brought out the fact that most subsistence farmers are working in isolation.

A large majority of subsistence farmers (72%) earned income from crop produce as their major source followed by livestock (22.4%). Only a handful (2.4%) earned income from casual labour and petty trade (2.6%) as their major sources. Majority (42.1%) earned less than Ushs50,000 (USD 14) per month from agriculture, which is far below the poverty line. They were followed by those who earned between shs50,001 and shs100,000 (37.1%). A significant number (10.8%) earned between shs100,001 and 150,000, and the rest above shs200,000 (9.5%). Generally, results showed that majority of subsistence farmers are poor. This is the category of the population being targeted by the government for transformation from subsistence to commercial agriculture.

Findings indicated that more than half (54.2%) of the respondents had attained primary education while up to 16.1% did not have any formal education. A significant number (23.4%) had completed ordinary level, 2.1% completed advanced level while 3.9% were diploma holders. Only one respondent (0.3%) possessed a first degree. The number of respondents who attained only primary education was lower than the national average of 58 percent. Educational attainment is an important indicator of the society's stock of human capital and level of social economic development (UBOS, 2014). This result shows that majority of the population in the study area had low education levels, hence low social-economic development.

Table 3: Socio-demographic characteristics of subsistence farmers who participated in the study (n=380)

Variable	Category	Frequency	Percentage
Gender of respondents	Male	172	45.3
	Female	208	54.7
	Total	**380**	**100**
Type of agriculture engaged in by respondents	Crop growing	62	16.3
	Animal keeping including poultry	17	4.5
	Mixed farming (crop and animal)	300	78.9
	Fishing	1	0.3
	Total	**380**	**100**
Number of years spent in	1-2 years	13	3.4
	3-5 years	51	13.4

agriculture	6-10 years	124	32.6
	more than 10 years	192	50.5
	Total	**380**	**100**
Major source of income for respondents	Crop produce	275	72.4
	Livestock	85	22.4
	Petty trade	10	2.6
	Casual labour	9	2.4
	Other	1	0.3
	Total	**380**	**100.0**
Amount of money earned from agriculture every month	Less than shs50,000	160	42.1
	shs500,001- shs100,000	141	37.1
	sh100,001shs - 150,000	41	10.8
	shs150,001 – shs 199,999	2	0.5
	shs200,000 and above	36	9.5
	Total	**380**	**100.0**
Membership in a farmers' groups	Yes	89	23.4
	No	291	76.6
	Total	**380**	**100**
Highest education level attained by respondents	None	61	16.1
	Primary	206	54.2
	O level (senior 1-4)	89	23.4
	A level (senior 5-6)	8	2.1
	Diploma holder	15	3.9
	First degree holder	1	0.3
	Total	**380**	**100.0**

Source: Field data 2017

The low incomes and low education levels among respondents coupled with individualism in their work, since majority of them do not belong to farmers' groups, indicate serious implications for agricultural extension programs in the area. If the respondents do not have any other source of income, it means that they belong to the category of the extreme poor who earn less than USD 1.25 a day (FAO, 2018). It is likely that the respondents cannot afford and access some communication channels. Sharing of information among farmers may not be guided by a common goal since each of them works on their own. Such people face constraints such as insufficient access to basic infrastructure (e.g. water, electricity, sanitation, and roads), and

inadequate access to public services (e.g. health, education, connectivity, and markets) (FAO, 2018). These findings mean that extension workers in the area must work much harder to meet the information needs of such farmers.

4.2.2 Profiles of extension workers

A total of seven agricultural extension workers were interviewed as key informants for the study. Only one extension worker (14.3%) was female and six (85.7%) were male. Six of them were based at the district headquarters while only one was based at the sub-county level. This was because sub-county level extension staff recruited under the NAADS program had been laid off pending implementation of a new extension structure by the government. The shortest period served by respondents as extension workers was 10 years while the longest was 27 years, giving an average of 17 years. This increased reliability of the information collected from them since they were highly experienced in their work as agricultural extension staff.

Table 4: Profiles of agricultural extension workers interviewed (n=7)

Position	Number of years in extension work	Duty Station
District Production Officer	20	District headquarters
District Commercial Officer	10	District headquarters
District Veterinary Officer	27	District headquarters
District Fisheries Officer	14	District headquarters
Animal Husbandry Officer	15	District headquarters
Agricultural Officer	13	District headquarters
Agricultural Officer	20	Sub-county Headquarters

Source: Field data 2017

4.3 Information needs of subsistence farmers

Vidanapathirana (2012) observed that there is a basic difference in the information needs for market oriented, transitional and subsistence based farming. In addition, information needs of farmers also differ depending on their location. One of the objectives of this study was to find out the information needs of subsistence farmers in Busimbi sub-county. Respondents were

allowed to give multiple responses for the information they needed since there is largely no specialization in the nature of work of subsistence farmers. Findings showed that 62.1% of subsistence farmers needed information on modern farming practices. This indicates the extent to which they appreciated their farming practices as rudimentary and needed to be improved. More than half (52.4%) needed information on pests and disease control, followed by good seed varieties (44.5%), fertilizer application (35%), crop prices (25.8%) and agricultural financing opportunities (18.4%). There was low interest in information on crop prices and financing opportunities probably because subsistence farmers have little to sell and mainly rely on family resources in their work.

Table 5: Agricultural information needed by subsistence farmers (n=380)

Information needed*(Multiple responses allowed)*	**Frequency**	**Percentage**
Modern farming practices	236	62.1
Agricultural financing opportunities	70	18.4
Good seed varieties	169	44.5
Fertilizer application	133	35
Pests and disease control	199	52.4
Crop prices	98	25.8

Source: Field data 2017

During interviews with extension workers, they largely echoed the information needs subsistence farmers had mentioned. One extension worker based at the district headquarters said subsistence farmers "*need to know modern skills so that they can grow and move from subsistence to commercial farming".* Another extension worker based at the sub-county said,

> *"because of climate change, they need information on irrigation, good seeds or farm inputs in general including seeds, tools, fertilizers, which affect production*".

These findings are similar to results of studies conducted by different scholars in India, Bangladesh and Tanzania (Meitei and Devi 2009, Singh 1990, Mittal, Gandhi and Tripathi 2010, Suresh, Kwadwo and Senthil 2011, Babu, Glendenning, Asenso-Okyere, and Govindarajan 2011,

Lwoga, Stilwell, Ngulube 2011, Kazi 2012, and Tumsifu and Silayo 2013). These studies also established that the most important information needs related to pest and disease management, fertilizer application, modern technology and seed varieties. Information on marketing and financing opportunities was not a priority. These results reflect a desire by subsistence farmers to access good planting materials and other inputs to improve practices and yields. Little interest is shown in post-harvest handling and marketing probably because the volume of their produce is low.

4.4 Perceived usefulness of information subsistence farmers receive from extension workers

One of the objectives of this study was to establish the perceived usefulness of information subsistence farmers receive from extension workers. Farmer perceptions were sought on ten indicators regarding the source of information, the message and the channels used in communication. The ten indicators as presented in table 5 below included: 1) extension workers as a major source of information on agriculture; 2) meetings with extension workers; 3) availability of information at the time of need; 4) relevance of information; 5) satisfaction of needs with the information received; 6) affordability of communication channels; 7) accessibility of communication channels; 8) satisfaction with the language; 9) duration; and 10) time of day information is disseminated by extension workers. Findings on each of the ten indicators are given later in this section.

On average, less than a quarter (24.5%) of subsistence farmers had positive perceptions about the contribution of extension workers on all the ten indicators. This was at a response rate of 54.3%. The average response rate was due to reference to information received by subsistence farmers from extension workers, whereby non-responses were entered for respondents who indicated that they had never received any information from extension workers. The percentage (24.5) of subsistence farmers in this study who had positive perceptions about extension workers was higher than in Pakistan where only 16.7% of farmers found extension workers to be effective (Khan and Akram, 2012). The highly negative perceptions probably explain the slow growth in the agricultural sector and high poverty levels among subsistence farmers. It means that majority did not benefit from the existence of extension workers, hence depicting a minimal contribution in meeting information needs of farmers.

4.4.1 Extension workers as a source of agricultural information

Study results showed that agricultural extension workers were a major source of information on agriculture to very few (2.1%) subsistence farmers. In fact, subsistence farmers relied more on other sources of information such as input dealers, friends and family members than extension workers. This indicator scored lowest, hence, portraying very negative perceptions about extension workers as an information source for subsistence farmers. These findings are underscored in the Uganda Poverty Status Report (MFPED, 2014) which lamented the scarcity of effective extension services at the sub county, parish and village level. Similarly, Khan and Akram (2012) cited studies by Muhammad and Chris (1999), Pervaiz (2009), Khan (2008), and Ahmad (1992) which showed that extension field staff were regarded as least effective amongst various information sources.

The very low percentage of subsistence farmers who perceived extension workers as a major source of information should be a cause for worry in a country like Uganda where the population relies heavily on agriculture for livelihood. It shows that extension services are negligible. However, the high dependence by farmers on their peers for information should also be worrying. It raises a question about the source of the information farmers share with their peers. Is it authentic information? Input dealers are largely profit oriented and may not be trained to give technical advice to farmers. In addition, the other information sources including friends and family members share similar characteristics such as low education levels. Therefore, the information subsistence farmers share as peers at their level may not add any value to their work.

4.4.2 Interactions between agricultural extension workers and farmers

A few (15.8%) subsistence farmers had ever met agricultural extension workers posted to their sub-county. This indicated negative perceptions about the contribution of extension workers in reaching out to subsistence farmers to meet their information needs. It is likely that extension workers rarely conducted field visits to the communities they are designated to serve. The problem of inadequate contact between farmers and extension workers was also discovered in a study conducted in four districts of Kenya where both farmers and extension personnel themselves expressed dissatisfaction with the quality and frequency of their interactions (Rees et al, 2000). In Pakistan, a vast majority (63%) of farmers reported that they had no contact with extension personnel (Khan and Akram, 2012). Without frequent contact, the contribution of

extension workers is not likely to be felt by farmers. According to Elias, Nohmi, Yasunobu, and Ishida (2015), for every unit increase in extension contact score, the odds of being satisfied with agricultural extension service increases by a factor of 2.89. They concluded that frequency of extension contact on a regular basis helps farmers to learn and discuss in detail about agricultural extension knowledge and innovations, which influence farmers' decision that enable them to take action. In this regard, subsistence farmers who do not interact with extension workers are unlikely to take any action hence remaining locked up in rudimentary practices (Elias, Nohmi, Yasunobu, and Ishida, 2015). The finding showing that up to 74.2% of subsistence farmers work on their own without any guidance means that extension workers have no impact on their lives. Such farmers are likely to get stuck with rudimentary farming practices leading to poor yields, food insecurity and poverty.

4.4.3 Availability of information at the time of need

Measuring availability of information at the time of need is important because subsistence farmers primarily rely on natural conditions for their crops to thrive, hence the need for timely information. Study results showed that very few (12.9%) subsistence farmers had information readily availed to them by extension workers at the time of need. Similar findings by Mwaura, Muwanika, Roland and Okoboi (2010) showed that Uganda's public extension system was unable to provide extension services to the farmers whenever they were needed. The failure by extension workers to avail information to subsistence farmers when they need it negates their contribution, hence negative perceptions of farmers about them. However, this variable did not consider whether subsistence farmers were taking initiative to request for information from extension workers. Findings from other studies regarding availability of agricultural information on demand indicate that farmers' information needs vary from time to time depending on the activities conducted during different periods of the season. The relevant information before the planting period may be crop management or scheduling of crop activities (Krishna Reddy & Ankaiah, 2005; Tiwari, 2008). During the growing season, other types of useful information such as weed control, fertilizer use in terms of amount and timing may play crucial roles in improving the amount and the quality of products (Ratnam, Krishna & Reddy, 2005; Tiwari, 2008). This shows that appropriate timing is an important aspect of communication in agriculture. When

farmers fail to access information at the time of need, their activities are likely to be hampered and they get frustrated due to the losses they suffer on their farms.

4.4.4 Relevance of information received from extension workers

FAO (1995) defined “relevance of agricultural extension activities" as the relationship between existing formulated agricultural extension topics in the extension service with farmers' expressed problems in farm work and need areas for agricultural advice. This study sought to establish whether the information subsistence farmers were receiving from extension workers was relevant to their needs. About a quarter (26.1%) of subsistence farmers perceived the information to be relevant. This shows that some of the information received was applicable to the needs of subsistence farmers. Relevance of agricultural information stretches beyond the needs of farmers to the capacity of extension workers to collect information and customize it to meet the needs of farmers. Irrelevant information is costly in terms of resources spent on preparations and dissemination, and the negative impact it might have on farmers. Irrelevant information erodes the confidence of farmers in extension workers and their perceptions about them become negative.

A study done in Suwannee Valley of North Central Florida showed that at least 87 percent of respondents trusted the information they received from extension agents regarding best management practices. Relevance of information held by extension workers also influences the initiative by farmers to consult. When farmers request for information, it probably shows that they find it relevant (Lawal, Oladokun and Kalusopa, 2015).

4.4.5 Satisfaction of farmers’ information needs by extension workers

The World Health Organisation asserts that client satisfaction evaluations help to address the reliability and responsiveness of services or the willingness of providers to meet clients’ needs (WHO, 2000). This study evaluated satisfaction of all information needs of subsistence farmers by extension workers. Results showed that very few (7.4%) subsistence farmers had all their information needs on agriculture met by extension workers. The results showed a huge gap between the information needs of farmers and the contributions extension workers made to meet them.

Findings about the needs of subsistence farmers discussed earlier in this chapter showed that extension workers were aware about them and reechoed them during key informant interviews. However, it is quite disturbing to find that farmers perceive the contribution of extension workers in meeting all their information needs to be almost non-existent. It is likely that the barriers discussed later in this chapter impede information held by extension workers from reaching farmers. It is also not clear whether extension workers are able to translate the knowledge and skills they possess into appropriate advice for farmers to satisfy their needs. Lawal, Oladokun and Kalusopa (2015) concluded that an efficient, dedicated, adequately trained and well oriented extension worker is essential for maintaining a healthy, productive channel of communication and change between research output and the farming community. It might also be important to take into account the status of extension workers specifically on their competencies, skills and job commitment to work (Khalil, Ismail, Suandi and Silong, 2008).

4.4.6 Affordability of information channels

A significant section (43.9%) of subsistence farmers perceived the channels used by extension workers to deliver information to them to be very or somewhat affordable. This was in reference to radio, which was mentioned as the main channel used by extension workers to deliver information to farmers because some local FM stations offer free airtime to extension workers to educate farmers about agriculture. This rating shows that extension workers make good efforts to select communication channels, which subsistence farmers can afford. The cost incurred by subsistence farmers to listen to radio was in purchasing radio sets, which is a one-off cost, and replacing batteries. This finding is partly in agreement with Kuponiyi (2000) who holds the view that radio is the only medium of mass communication that the rural population is very familiar with because a radio set is cheap to obtain and is widely owned in the rural areas.

However, the paradox is that while radio is affordable to subsistence farmers, it is a very expensive communication medium on the side of extension workers because of the prohibitive cost of buying airtime, unless radio stations offer it free of charge. In addition, Reisenberg and Gor (1989) attributed the declining impact of extension services to placing more emphasis on the use of mass media for agricultural information transfer. Given the low education levels of majority of subsistence farmers and the transient nature of radio as a communication medium,

extension workers would need a lot of time on radio to educate farmers well on any particular topic.

Extension workers indicated that they use meetings as a key communication channel because they are cheap or do not cost subsistence farmers any money to obtain the information.

> *"Attending meetings is affordable for farmers because they are held within their communities."* (extension worker based at district headquarters).
>
> *"We hold meetings at landing sites. At that time, whoever is at the landing site as a fisherman or fish trader attends. The turn up is usually very high." (*extension worker based at district headquarters).

The above analysis shows that while extension workers use meetings as the cheapest communication channel, farmers perceive radio to be the most common and affordable medium extension workers use to reach them. This is probably due to the fact the frequency of radio programs on agriculture is higher than that of community meetings organized by extension workers.

4.4.7 Accessibility of information channels

Subsistence farmers were asked to rate accessibility of the channels extension workers use to deliver information to them. A significant section (42.6%) rated the channels as accessible or somewhat accessible. This was particularly in reference to radio which they can listen to in the comfort of their homes, and occasional meetings held by extension workers within their communities. During interviews with extension workers, they indicated that they usually organised meetings at village and parish level where farmers could easily access the venues. This finding is partly in agreement with Kumar (2011) who held the view that it is necessary that both mass media and interpersonal communication infrastructures are accessible to the people, both physically and socially. Margomo and Sugimoto (2011) when conducting a study on barriers of Indonesian extension workers found that accessibility to channels of communication had eased the process. In this study, while extension workers indicated that the venues for meetings at parish and village level were accessible to farmers, a question arises about the frequency of such meetings. In a situation where only 15.8 percent of respondents had ever met extension workers, it is unlikely that parish and village meetings were held frequently. This is probably the reason

why farmers consider radio to be their most accessible communication channel for agricultural information.

4.4.8 Duration of time dedicated to providing information to farmers

Related to the channels of communication is the duration of time extension workers spend disseminating information to subsistence farmers. A few (20%) of the subsistence farmers found the amount of time extension workers dedicated to giving them information enough. This showed that majority of subsistence farmers needed more time with extension workers to understand the information disseminated very well. During interviews with extension workers, they revealed that the available resources dictated the duration of time allocated to information dissemination. For instance, an extension worker could not prolong a farmers' meeting for more than three hours when there is no provision for participants' refreshments.

> *"If you invite farmers for a meeting and you say it is for the whole day, if you are expecting fifty farmers, you may get only fifteen."* (extension worker based at district headquarters).

> *"Time is there but the only problem is facilitation. You can have time but are you facilitated? You may want to be with them (*farmers) *for a long time but you don't have capacity to give them lunch."* (extension worker based at sub-county level).

The limitations on the time for interactions between subsistence farmers and extension workers may have serious negative implications because issues are not discussed exhaustively. Mihály (2010) emphasizes that it is crucial to budget for adequate time for content. Findings show that while extension workers were willing to spend more time with farmers, lack of facilitation to provide meals to farmers during meetings prevented them from doing so. Brief meetings would require increased frequency which is again not possible given the low staffing levels and expanse of the area an extension worker is supposed to cover. Consequently, extension workers fail to make a significant contribution in meeting information needs of farmers.

4.4.9 Time of day selected for information dissemination

Over a quarter (26.3%) of subsistence farmers were happy about the time of day chosen by extension workers to disseminate information to them. They liked late evening radio programmes, which they are able to listen to when they are resting after the day's work.

Similarly, extension workers indicated in interviews that they always consider the nature of work of farmers when scheduling radio programmes and meetings. Radio programmes are scheduled for late evening hours while meetings are held in the afternoon when farmers have retired from the day's work in their gardens and had lunch at home.

> "*The most convenient time to meet farmers is after lunch, that is, after 2 o'clock. In the morning, people think that they can meet at ten but most farmers are in the gardens at that time. They get time at around midday when they come out of their gardens, then get their lunch. At around two to four (o'clock), that is the most convenient time. That is when you call farmers and get them but in the morning, it is hard to get them,"* extension worker based at district headquarters.

The above assertion confirms the view by Mihály (2010) that timing for communication between extension workers and farmers must be customised to suit local communities with their unique and peculiar requirements. Khumphicha (2011) described his findings about timing as interesting because to majority of the participants, it was convenient to obtain information between six and nine o'clock in the evening whereas others preferred to receive the information in the morning between six and ten o'clock. Even for this study, only about a quarter of subsistence farmers were satisfied with the time they received information from extension workers.

4.4.10 Perceptions on language used by extension workers

Language appropriateness is a key element of effective communication that facilitates or impedes understanding of the message. Nearly half (47.4%) of subsistence farmers perceived the language used by extension workers to be very understandable, hence reflecting average perception on this aspect. This was also the highest score among the ten variables used to measure perceptions of subsistence farmers about extension workers in this study. This shows that extension workers were able to make the appropriate choice of language best understood by subsistence farmers. An extension worker based at district level said in an interview that,

"*We usually use the common language, that is, in a place like here, we usually use Luganda.*"

This finding agrees with FAO (2011) which asserts that making information understandable and meaningful is among the main functions of extension work. A study conducted in Nigeria found out that farmers were complaining about use of unfamiliar terminologies by extension workers which they could not understand (Oladusu, 2006 in Mcharo, 2013). Further, Kumar (2011)

argues that methods of communication must give people messages in simple language for understanding. Kumar (2011) asserts that development plans must be carried in every home in the language and symbols of the people. These assertions are made more relevant by the fact that the highest level of education attained by up to 70.3 percent of respondents in this study was primary school. Simplifying the extension language for such an audience to understand it is paramount.

Table 6: Overall ratings of subsistence farmers' perceptions about extension workers in meeting their information needs

Variable *(Multiple responses allowed)*	**Frequency**	**Percentage**	**Response rate**
Extension worker as a major source of information	8	2.1	100.0
Ever meeting the sub-county extension worker	60	15.8	100.0
Availability of information at the time of need	49	12.9	32.6
Relevance of information from extension workers	99	26.1	32.4
Satisfaction with information from extension workers	28	7.4	30.8
Affordability of communication channels used by extension workers	167	43.9	50.8
Accessibility of communication channels used by extension workers	162	42.6	49.7
Satisfaction with the duration of time extension workers dedicate to giving information	76	20.0	49.7
Satisfaction with the time of day extension workers disseminate information	100	26.3	47.1
Satisfaction with language used by extension workers	180	47.4	50.3
Average score	**93**	**24.5**	**54.3**

Source: Field data 2017

4.5 Socio-demographic factors influencing farmer perceptions about extension workers in meeting their information needs

4.5.1 Gender and perceptions about extension workers

It is widely believed that women constitute the largest majority of farmers and pursue multiple livelihood strategies (FAO, 2011) but face gender inequalities in agriculture including access to extension services (Christoplos, 2010). This is confirmed by findings of this study, which showed that, on average, more male (25.1%) than female (23.9%) subsistence farmers perceived extension workers to have a contribution in meeting their information needs. The difference (1.2%) is considered significant due to the fact that more female (54.7%) than male (45.3%) subsistence farmers participated in the study. More females perceived the contribution of agricultural extension workers more positively than males on aspects of relevance of information received (F=30.3%, M=20.9%), affordability of communication channels (F=45.2%, M=42.4%), accessibility of communication channels (F=44.2%, M=40.7%) and satisfaction with the language used (F=47.6%, M=47.1%). More males perceived extension workers more positively than females on being a major source of information (F=1.4%, M=2.9%), meeting extension workers (F=14.9%, M=16.9%), availability of information at the time of need (F=12.5%, M=13.4%), duration of time (F=14.4%, M=26.7%) and the time of day (F=20.7%, M=33.1%) extension workers choose to communicate to subsistence farmers. Generally, the perceptions of both genders about agricultural extension workers were below average. Nevertheless, it is evident that gender is a determinant of perceptions about extension workers in meeting their information needs. A study done in Amathole, South Africa found that the total number of females satisfied with extension services was higher than the males. This finding agrees with Davis (2006) that gender has an influence on perception about extension programme delivery although results from different studies tend to vary in terms of the gender that is more satisfied.

Table 7: Perceptions of male and female subsistence farmers about extension workers in meeting their information needs

Gender of subsistence farmer	**Male (n=172)**		**Female (n=208)**	
Variable	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Extension worker as a major source of information	5	2.9	3	1.4
Ever meeting the sub-county extension worker	29	16.9	31	14.9
Availability of information at the time of need	23	13.4	26	12.5
Relevance of information from extension workers	36	20.9	63	30.3
Satisfaction with information from extension workers	12	7.0	16	7.7
Affordability of communication channels used by extension workers	73	42.4	94	45.2
Accessibility of communication channels used by extension workers	70	40.7	92	44.2
Satisfaction with language used by extension workers	81	47.1	99	47.6
Satisfaction with the duration of time extension workers dedicate to giving information	46	26.7	30	14.4
Satisfaction with the time of day extension workers disseminate information	57	33.1	43	20.7
Average	**43.2**	**25.1**	**49.7**	**23.9**

Source: Field data 2017

4.5.2 Perceptions of different categories of subsistence farmers about extension workers in meeting their information needs

Farmers engaging in different types of agriculture are expected to have different information needs, which should be addressed differently by extension workers. For instance, information needed by a livestock farmer is most likely different from what a crop grower needs. Their perceptions on effectiveness of agricultural extension workers are also expected to differ

depending on how their specific needs are met. Results of this study show that, on average, the fisherman (single respondent) perceived extension workers more positively (50%) than the other categories of subsistence farmers. His positive perception was in aspects of meeting extension workers, relevance of information, affordability of communication channels, the language used, and the time of day extension workers disseminate information to farmers. This average level of satisfaction is probably due to the highly specialised nature of his work (fishing). For instance, an extension officer working closely with the fishing community revealed that information is usually passed on to the fishing community through meetings held at landing sites early in the morning when fishers gather to transact business. The meetings are highly structured to fit into the daily schedules of fishermen.

> *"We hold meetings* in *the morning at eight, after nine (o'clock) you can't meet fishers. "It* (a meeting) *should be as short as possible. After thirty minutes, it becomes useless. Even when they are asking questions, it does not go beyond twenty to thirty (minutes),"* extension worker based at district headquarters who works with fishing communities.

However, more mixed farmers (20.9%) than crop growers (7.7%) and animal keepers (18.2%) had positive perceptions about extension workers. Therefore, the influence of the type of agriculture and level of specialisation on perceptions of subsistence farmers about extension workers in meeting their information needs is not clear.

Table 8: Types of farmers and their perceptions about extension workers

Type of agriculture engaged in by subsistence farmer	**Crop growing (n=62)**		**Animal keeping (n=17)**		**Mixed farming (n=300)**		**Fishing (n=1)**	
Variable	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**
Extension worker as a major source of information	0	0.0	2	11.8	3	1.0	0	0
Ever meeting the sub-county extension worker	2	3.2	5	29.4	52	17.3	1	100

Availability of information at the time of need	0	0.0	2	11.8	52	17.3	0	0
Relevance of information from extension workers	1	1.6	4	23.5	100	33.3	1	100
Satisfaction with information from extension workers	0	0.0	1	5.9	32	10.7	0	0
Affordability of communication channels used by extension workers	3	4.8	1	5.9	44	14.7	1	100
Accessibility of communication channels used by extension workers	0	0.0	0	0.0	36	12.0	0	0
Satisfaction with language used by extension workers	16	25.8	6	35.3	165	55.0	1	100
Satisfaction with the duration of time extension workers dedicate to giving information	11	17.7	5	29.4	62	20.7	0	0
Satisfaction with the time of day extension workers disseminate information	15	24.2	5	29.4	82	27.3	1	100
Average score	**5**	**7.7**	**3**	**18.2**	**63**	**20.9**	**0.5**	**50**

Source: Field data 2017

4.5.3 Years of experience in agriculture and perceptions about extension workers

The number of years a farmer spends doing the same kind of work may have different implications on the information needed; he/she either has all the relevant contacts of experts and knows how to obtain information from them or has mastered the trade and does not need any advice. However, Khan and Akram (2012) observed that practicing farming for many years does not make farmers experts but rather equips them with farming experience learned through informal education. This study sought to establish whether the number of years spent in practicing farming had any influence on perceptions of subsistence farmers about agricultural extension workers. Results in table 8 below show that subsistence farmers with 3-5 years (33.5%) and 6-10 years (31.0%) in farming had more positive perceptions about extension

workers than their counterparts of 1-2 years (13.1%) and more than 10 years (20.4%). While it may be argued that new farmers (1-2 years) had not known how to access extension workers although they considered them a major source of information, it is not clear why the perceptions dropped again for those with more than 10 years of farming experience. This affirms as an assertion by Elias, Nohmi, Yasunobu, and Ishida (20150) that the influence of the number of years spent in farming on a farmer's satisfaction with extension services is not clear.

Table 9: Perceptions of subsistence farmers of different years of experience in agriculture about extension workers

Number of years in agriculture	**1-2 (n=13)**		**3-5 (n=51)**		**6-10 (n=124)**		**More than 10 (n=192)**	
Variable	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**
Extension worker as a major source of information	2	15.4	0	0.0	2	1.6	3	1.6
Ever meeting the sub-county extension worker	1	7.7	13	25.5	13	10.5	33	17.2
Availability of information at the time of need	2	15.4	7	13.7	26	21.0	17	8.9
Relevance of information from extension workers	1	7.7	18	35.3	51	41.1	34	17.7
Satisfaction with information from extension workers	1	7.7	12	23.5	11	8.9	9	4.7
Affordability of communication channels used by extension workers	3	23.1	29	56.9	75	60.5	66	34.4
Accessibility of communication channels used by extension workers	3	23.1	30	58.8	71	57.3	64	33.3
Satisfaction with language used by extension workers	2	15.4	30	58.8	80	64.5	74	38.5
Satisfaction with the duration of time extension workers dedicate to giving information	1	7.7	14	27.5	24	19.4	39	20.3
Satisfaction with the time of day extension workers disseminate information	1	7.7	18	35.3	31	25.0	53	27.6
Average score	**2**	**13.1**	**17**	**33.5**	**38**	**31.0**	**39**	**20.4**

Source: Field data 2017

4.5.4 Farmers' group membership and perceptions about extension workers

About 10 years ago, the government of Uganda made deliberate efforts under the NAADS program to organise farmers into groups at village level (Kwapong and Nkonya, 2015) in what was called farmer institutional development. This is because targeting organised groups of farmers is believed to be faster and more cost effective than reaching out to individuals (Age, Obinne and Demenongu, 2012, Adhiguru, Birthal and Kumar, 2009). However, as seen earlier in this chapter, only 23.4% of the subsistence farmers who participated in this study belonged to farmers' groups. This study did not explore whether farmers' groups existed and were not popular or just a few were in place. Nonetheless, as shown in table 9 below, on average, nearly half (48.2%) of members of farmers' groups perceived agricultural extension workers' performance to be good in four of the ten aspects: relevance of information (60.7%), affordability of communication channels (83.1%), accessibility of communication channels (80.9%), and language used (87.6%). On the other hand, non members of farmers' groups had low regard for extension workers on all indicators. Similar findings were obtained in Eastern Caribbean where members of farmers' groups were found to be more satisfied with extension than non-members (Ganpat, Webster and Narine, 2014).This result suggests that membership of subsistence farmers in farmers' groups positively influences their perceptions about the contribution of extension workers in meeting their information needs.

Table 10: Perceptions of members and non-members of farmers' groups about extension workers in meeting their information needs

Membership in a farmers' group	**Members (n=89)**		**Non members (n=291)**	
Variable	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Extension worker as a major source of information	3	3.4	5	1.7
Ever meeting the sub-county extension worker	29	32.6	31	10.7
Availability of information at the time of need	35	39.3	19	6.5
Relevance of information from extension workers	54	60.7	52	17.9
Satisfaction with information from extension workers	22	24.7	11	3.8

Affordability of communication channels used by extension workers	74	83.1	101	34.7
Accessibility of communication channels used by extension workers	72	80.9	98	33.7
Satisfaction with language used by extension workers	78	87.6	110	37.8
Satisfaction with the duration of time extension workers dedicate to giving information	24	27.0	54	18.6
Satisfaction with the time of day extension workers disseminate information	38	42.7	65	22.3
Average score	**43**	**48.2**	**55**	**18.8**

Source: Field data 2017

4.5.5 Subsistence farmers' education levels and perceptions about extension workers

One of the purposes of education is to make an individual aware of available opportunities and use them to improve their well-being. Education plays a great role in the development of nations and advancement in their communication (Khan and Akram, 2012). This study sought to establish the correlation between education levels of subsistence farmers and their perceptions about the contribution of extension workers in meeting their information needs. Results showed that the higher the level of education of subsistence farmers, the more positive were the perceptions about the contribution of extension workers. For instance, 56.7% of diploma holders perceived extension workers more positively compared to 4.9% and 27.3% of the uneducated and primary school leavers respectively. This confirms a proposal by Elias, Nohmi, Yasunobu, and Ishida (2015) that a 'farmer's education status influences positively his/her satisfaction with the extension service'. In addition Terry and Israel (2004) as cited by Elias, Nohmi, Yasunobu, and Ishida (2015) assert that the higher the clients' education level the greater their likelihood of satisfaction with extension service. Khan and Akram (2012) observed no significant association between farmers' level of education and contact with extension workers but they added that that extension workers are thought to contact literate farmers more than illiterate farmers because the former are easy to convince to adopt new agricultural technologies. However, a study conducted in Eastern Caribbean found that 'farmers who attained higher levels of education secondary/tertiary were less satisfied with extension than farmers with lower levels of education' (Ganpat, Webster and Narine, 2014). Despite this finding, most studies agree that there is a

positive correlation between education levels of farmers and their perceptions about the contribution extension workers.

Generally, the above discussion may explain why majority of respondents in this study had negative perceptions about the contribution of extension workers in meeting their information needs. In a population where 16.1 percent have no education and 54.2 percent possess only primary education, it is likely that many challenges may be encountered in the process of receiving information from extension workers. An extension worker may have to be very creative and work much harder to meet the information needs of an illiterate or semi literate farmer.

Table 11: Perceptions of subsistence farmers of different education levels about extension workers

Level of education	**None (n=61)**		**Primary (n=206)**		**O' level (n=89)**		**A level (n=8)**		**Diploma (n=15)**		**First degree (n=1)**	
Variable	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**
Extension worker as a major source of information	0	0.0	5	2.4	3	3.4	0	0	0	0.0	0	0
Ever meeting the sub-county extension worker	0	0.0	28	13.6	27	30.3	3	37.5	1	6.7	1	100
Availability of information at the time of need	0	0.0	29	14.1	10	11.2	1	12.5	14	93.3	0	0
Relevance of information from extension workers	0	0.0	57	27.7	31	34.8	3	37.5	14	93.3	1	100
Satisfaction with information from extension workers	0	0.0	16	7.8	16	18.0	1	12.5	0	0.0	0	0
Affordability of communication channels used by extension	6	9.8	101	49.0	46	51.7	1	12.5	14	93.3	1	100
Accessibility of communication channels used by extension	6	9.8	97	47.1	45	50.6	6	75	14	93.3	1	100

Satisfaction with language used by extension workers	8	13.1	108	52.4	51	57.3	5	62.5	14	93.3	1	100
Satisfaction with the duration of time extension workers	2	3.3	63	30.6	28	31.5	3	37.5	14	93.3	1	100
Satisfaction with the time of day extension workers disseminate information	8	13.1	58	28.2	31	34.8	4	50	0	0.0	1	100
Average score	**3**	**4.9**	**56**	**27.3**	**29**	**32.4**	**3**	**33.8**	**9**	**56.7**	**1**	**70**

Source: Field data 2017

4.5.6 Influence of major income source on perceptions of subsistence farmers about extension workers

An individual's major source of income is expected to have a great influence on his/her way of life and the choices they make. This is particularly because one's source of livelihood usually consumes the biggest part of their effort and time in order to maximize benefits. Results of this study showed that a single respondent whose major source of income was relatives perceived extension workers to be effective (50%) more than those who depended on livestock (28.8%), casual labour (25.6%), petty trade (25%) and crop produce (24.8%). This outlier (50%) may be explained by results of a study done in North West Ethiopia which concluded that off farm income positively influences satisfaction with agricultural extension services (Elias, Nohmi, Yasunobu, and Ishida, 2015). The researchers argued that farmers with off farm income tend to be more satisfied because they can afford the expenses of extension service inputs (Elias, Nohmi, Yasunobu, and Ishida, 2015). The relatively high number of livestock keepers (28.8%) satisfied with extension services may be linked to morbidity among livestock which calls for urgent attention as explained by one extension worker in an interview:

> *"For us in the livestock sector, farmers come because their problems need urgent attention."*(Extension worker based at district headquarters).

From the above finding, it may be proposed that the nature of a farmer's major source of income and availability of income from other sources positively influence perceptions about agricultural extension workers. For instance, livestock keepers whose trade by nature requires urgent attention in case of illness among animals take the initiative to look for veterinary extension workers for help, which in turn may improve their satisfaction levels if their needs are met. For

farmers with other income sources, it is probable, as suggested by Elias, Nohmi, Yasunobu, and Ishida (2015) that, all they need from the extension worker is advice because they can afford the agricultural inputs.

Table 12: Perceptions of subsistence farmers of different major income sources on effectiveness of extension workers

Major source of income	**Crop produce (n=275)**		**Livestock (n=85)**		**Petty trade (n=10)**		**Casual labour (n=9)**		**Other (n=1)**	
Variable	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**
Extension worker as a major source of information	3	1.1	5	5.9	0	0	0	0.0	0	0
Ever meeting the sub-county extension worker	44	16.0	15	17.6	1	10	0	0.0	0	0
Availability of information at the time of need	29	10.5	23	27.1	0	0	2	22.2	0	0
Relevance of information from extension workers	74	26.9	29	34.1	1	10	2	22.2	0	0
Satisfaction with information from extension workers	24	8.7	7	8.2	0	0	2	22.2	0	0
Affordability of communication channels used by extension	123	44.7	42	49.4	5	50	4	44.4	1	100
Accessibility of communication channels used by extension	118	42.9	42	49.4	5	50	4	44.4	1	100
Satisfaction with language used by extension workers	136	49.5	43	50.6	5	50	3	33.3	1	100
Satisfaction with the duration of time extension workers dedicate	57	20.7	16	18.8	3	30	1	11.1	1	100
Satisfaction with the time of day extension workers disseminate	73	26.5	23	27.1	5	50	5	55.6	1	100
Average score	**68**	**24.8**	**25**	**28.8**	**3**	**25**	**2**	**25.6**	**1**	**50**

Source: Field data 2017

4.5.7 Influence of income levels on perceptions of subsistence farmers about the contribution of extension workers

A person's level of income greatly influences his/her demand for goods and services and utilization of opportunities. Access to information is usually influenced by an individual's ability to afford the channels through which it is disseminated. Poor farmers are unable to access some information channels such modern ICT tools (UBOS, 2014; Khumphicha, 2011). In addition, utilization of information may also depend on capacity to obtain the necessary materials such as agricultural inputs, which may require cash. This study established that more subsistence farmers with higher income levels from agriculture perceived extension workers to be effective more than those of low incomes. For instance, 55% of subsistence farmers earning between shs150,001 – 199,999 and 36.7% of those earning above shs 200,000 per month from agriculture perceived extension workers more positively compared to only 17% of those earning less than shs50,000. This suggests that the monthly income subsistence farmers obtain from agriculture positively influences their perceptions about agricultural extension workers in satisfying their information needs; the higher the income, the more positive are the perceptions.

Table 13: Perceptions of subsistence farmers of different agricultural income levels about extension workers

Level of income from agriculture (shs)	**>50,000 (n=160)**		**500,001 – 100,000 (n=141)**		**100,001 - 150,000 (n=41)**		**150,001 – 199,999 (n=2)**		**< 200,000 (n=36)**	
Variable	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**	**Frequency**	**% age**
Extension worker as a major source of information	1	0.6	2	1.4	2	4.9	0	0	3	8.3
Ever meeting the sub-county extension worker	8	5.0	29	20.6	9	22.0	1	50	13	36.1
Availability of information at the time of need	11	6.9	31	22.0	3	7.3	1	50	7	19.4
Relevance of information from extension workers	23	14.4	58	41.1	10	24.4	1	50	13	36.1
Satisfaction with information from	11	6.9	15	10.6	2	4.9	0	0	5	13.9

extension workers										
Affordability of communication channels used by extension workers	56	35.0	76	53.9	19	46.3	2	100	20	55.6
Accessibility of communication channels used by extension workers	55	34.4	75	53.2	16	39.0	2	100	20	55.6
Satisfaction with language used by extension workers	57	35.6	83	58.9	23	56.1	2	100	21	58.3
Satisfaction with the duration of time extension workers dedicate to giving information	24	15.0	25	17.7	15	36.6	0	0	12	33.3
Satisfaction with the time of day extension workers disseminate information	30	18.8	34	24.1	17	41.5	2	100	18	50.0
Average score	**28**	**17.3**	**43**	**30.4**	**12**	**28.3**	**1**	**55.0**	**13**	**36.7**

Source: Field data 2017

4.6 Constraints faced by subsistence farmers and extension workers in exchanging information

The fourth objective of the study was to establish constraints faced by extension workers and subsistence farmers in exchanging information on agriculture. Results indicated that the major constraint for subsistence farmers was lack of knowledge on how to access extension workers (33.2%), followed by long distances to the sub-county (23.7%), and absence of extension workers (21.3%). A significant percentage (16.3%) of subsistence farmers indicated that extension workers were too busy. At least 3.7% of subsistence farmers felt that being non-members of farmers' groups deterred them from communicating effectively with extension workers. Other constraints mentioned were lack of commitment on the side of extension workers (0.3%), demand for money for services by extension workers (0.3%), and uncommitted village chairpersons (0.3%).

It can be deduced from the responses that subsistence farmers felt that they were detached from extension workers. Extension workers were largely not available or visible to subsistence farmers. The lack of knowledge on how to access extension workers equally signals ignorance

about existence of the services although extension workers indicated that they provided their telephone contacts on sub-county notice boards and whenever they visited farmers in villages.

Similar constraints facing subsistence farmers were mentioned in studies by Galadima (2014) and Siyao (2012) which showed that farmers lacked means and facilities to access information. Farmers willingness to pay for some communication channels was also found to be low (Suresh, Kwadwo and Senthil, 2011).

Table 14: Constraints faced by subsistence farmers in exchanging information with extension workers

Channel	Frequency	Percentage
There are no extension workers	81	21.3
I do not belong to a farmers' group	14	3.7
I don't know how to access the extension worker	126	33.2
Long distance to the sub-county	90	23.7
Extension workers are too busy	62	16.3
Other	3	0.8
No response	4	1.1
Total	**380**	**100**

Extension workers also enumerated a number of constraints they face in communicating with farmers, majority of them focusing on inadequate facilitation.

"Challenge number one is lack of facilitation funds. We would wish to reach as many farmers as possible but at times, it is very difficult because we can't move. You don't have a vehicle, you don't have facilitation allowance; that is what most extension workers are lacking." (Extension worker based at district headquarters).

*"What hinders us from meeting farmers mainly is the budget. Sometimes you make a budget for meeting farmers but you fail because of the (*funds*) releases. Sometime back, we used to get monthly releases but the government decided to give that money in quarterly releases. Sometimes it is hard for us to go to the field because we don't have the funds to meet different farmers." (*Extension worker based at district headquarters).

"For example, they say in a quarter you get shs35,000 as facilitation for lunch and fuel. How do you think someone will be working every day with that amount ... and they expect you to deliver!..sometimes you don't have a motorbike. You find that work becomes hard." (Extension worker based at sub-county level).

"Sometimes it is the road network coupled with weather changes. You may plan to meet farmers but fail because it has rained and you cannot move on the bad roads." (Extension worker based at district headquarters).

"The other challenge is that the farmers themselves are not very keen at getting these new skills. You can arrange for a meeting expecting may be around twenty people but only five people turn up." (Extension worker based at district headquarters).

"When we are in the field, our farmers always tell us that they want trainers but when we take trainers near to them, most of them don't come from their homes. They give excuses that today I am planting, I am weeding and they do not attend." (Extension worker based at district headquarters).

"*Some (*technical) *terms do not have direct words in Luganda (the local language). To communicate that (*technical information*) to a person becomes a very big problem."* (Extension worker based at district headquarters).

The above views show that extension workers face numerous challenges relating to inadequate facilitation, which include low funding and lack of transport facilities, poor road network and low turn up of farmers for meetings and training sessions. These findings are similar to those recorded by Margono and Sugimoto (2011), Purcell and Anderson (1997), which showed that extension workers are hindered from interacting with farmers by long physical distances and lack of transportation facilities. Problems of insufficient funding disrupting free flow of information were also cited in numerous studies (Bell and Obinne, 2012, Lawal, Oladokun, Kalusopa, 2015, Ozor, 2010, Saliu1, Obinne and Audu, 2009). Apparently, the problem of limited funding on the side of extension workers and poverty on the side of farmers hinders extension workers from making a significant contribution in meeting farmers' information needs. The consequence is negative perceptions on the side of farmers because their needs are never satisfied.

4.6.1 Suggestions for improving communication between subsistence farmers and extension workers

To make the study significant to policy makers, each respondent was asked to suggest one way for improving communication between farmers and extension workers. Majority (38.4%) of subsistence farmers suggested that extension workers should visit farmers in villages and hold seminars. Others suggested that government should recruit more extension workers (15.0%) and extension workers should share their telephone contacts with farmers (12.6%). There were also suggestions for extension workers to be committed to their work (6.8%), be forced to do their work (6.1%), and be well facilitated (5%).

Table 15: Suggestions of subsistence farmers for improving communication with extension workers

Suggestion for improvement	Frequency	Percentage
Extension workers should visit farmers in villages and hold seminars	146	38.4
Government should recruit more extension workers	57	15.0
Extension workers should share their telephone contacts with farmers	48	12.6
Extension workers should be committed to their work and give farmers time	26	6.8
Extension workers must be forced to do their work and made	23	6.1
Extension workers should be well facilitated	19	5
Local leaders at village level should coordinate meetings between farmers and extension workers	17	4.5
Farmers should form groups and look for extension workers	12	3.2
Extension workers should use local radio to reach farmers	10	2.6
Recruit community based extension workers	5	1.3
Distribute printed materials to farmers	5	1.3
Establish demonstration gardens and farm institutes	2	0.5
Extension workers should involve farmers in drawing work plans and share visitation schedules	2	0.5
Sensitise farmers on how to access extension workers	2	0.5
Go back to the extension system used in 1960s	2	0.5
Non response	4	1.1
Total	**380**	**100**

If the above suggestions are implemented, extension workers are likely to be seen to contribute more to meeting the information needs of subsistence farmers. Extension workers also had suggestions almost similar to those of the subsistence farmers.

"Finding a farmer at his farm and telling him what to do is better than calling for a meeting. Most of them are fed up, they don't turn up and at times even if you teach them in a meeting, some of them don't adopt. But if you explain to them at their farm and after that you take them for a farm exchange visit, there they can learn better." (Extension worker based at district headquarters).

"...it all goes back to facilitation because we need to be facilitated to make demonstrations and visit them frequently but with minor facilitation, what much can be done?" (Extension worker based at sub-county level).

"If farmers can take up the idea of cooperatives or group formation, it is better. Group marketing, group production,...if you find that poultry farmers have their association, dairy farmers have their association, there it is easier for information to flow. If these people are to transit from subsistence farming to commercial farming, they must make sure they form those groups." (Extension worker based at district headquarters).

*"The good thing is that most Ugandans are now a bit educated. We can use sms (short messaging service) to send information to their phones."(*Extension worker based at district headquarters).

*"Farmers should attend our meetings to get the information they want." (*Extension worker based at district headquarters).

"I have realised that it is better to put more emphasis on sensitizing that enforcing because if they own their lake, they own their fish, then they will adhere more than using force on them." (Extension worker based at district headquarters).

"We need TV and radio programmes. We have power on many landing sites now. Where there is no power, they use solar". (Extension worker based at district headquarters).

"If we would organise like drama that is basically targeting fishing and it is serialised on tv and they watch it series...and take especially case studies of where lakes have lost all the fish. They do now believe that fish can be completely depleted. When that information enters (someone's mind) it won't come out." (Extension worker based at district headquarters).

*"Farmer to extension ratio should be improved. One person cannot be effective in a sub-county."(*Extension worker based at sub-county level).

Similar recommendations were made in other studies. Galadima (2014) advised that extension workers should be more committed to their work, more approachable, and should provide feedback mechanisms. Lawal, Oladokun and Kalusopa (2015) recommended that extension workers should be provided with transport, allowances, and cell-phones to deliver extension messages in time. Alemu and Demese (2005) further recommended introducing a reward system for good performance, which was not mentioned in this study. The recommendation on compelling extension workers to work was echoed by Khan and Akram (2012) who observed a need to supervise activities of extension personnel on a regular basis so that they can perform their duties properly. Although extension workers hinted on using modern technology such as telephone text messages as established in other studies (Tumsifu and Silayo, 2013, and Lawal, Oladokun, Kalusopa, 2015), subsistence farmers focused more on traditional means of communication. This shows that subsistence farmers need to be supported to embrace modern communication tools.

4.7 Conclusion

This chapter has presented and discussed all the key findings of the study in relation to the general and specific objectives. The major information needs of subsistence farmers concerned modern farming practices; pests and disease control; good seed varieties; fertilizer application; crop prices; and, agricultural financing opportunities. In a nutshell, subsistence farmers had negative perceptions about the contribution of extension workers in meeting their information needs. Their needs were largely unmet due challenges relating to poor choice of communication channels used to deliver the information, which mainly stem from inadequate facilitation and low staffing levels. The key recommendations for improvement are: recruitment of more extension workers and facilitating them to visit farmers, close supervision of extension workers and commitment to do their work. On the other hand, farmers need to be more organized and proactive in approaching extension workers for information.

CHAPTER FIVE : SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of key findings of the study, conclusions, recommendations and suggestions for future research.

5.2 Summary

The major objective of this study was to establish farmer perceptions about the contribution of agricultural extension workers in meeting their information needs. A total of 380 (54.7% female and 45.3% male) subsistence farmers living in Busimbi sub-county and seven extension workers were interviewed during the study. Findings showed that majority of subsistence farmers (78.9%) engaged in mixed farming and had practiced agriculture for more than 10 years (50.5%). Their major source of income was crop produce (72%) and most of them (42.1%) earned less than shs50,000 per month from agriculture, which is below the poverty line. More than half (54.2%) of subsistence farmers had attained primary education. Their information needs in agriculture concerned modern farming practices (62.1%), pests and disease control (52.4%), good seed varieties, fertilizer application, crop prices and financing opportunities.

On average, only 24.5% of subsistence farmers had positive perceptions about the contribution of agricultural extension workers in meeting their information needs. Very few subsistence farmers perceived extension workers as a major source of information (2.1%). Only 15.8 % had met extension workers while only 12.9% received information at the time of need. Only 26.3% perceived the information from extension workers to be relevant. Extension workers were also perceived negatively on duration of time (20%) and time of day (26.3%) they disseminate information to farmers. They were perceived almost averagely for affordability of communication channels (43.9%), accessibility of channels (42.6%) and language used (47.4%). Generally, farmers perceptions about the contribution of extension workers in meeting their information needs were negative.

The socio-demographic factors found to influence perceptions about the contribution of agricultural extension workers in meeting information needs of subsistence farmers were gender, membership in farmers' groups, level of education, major source of income and amount of

income from agriculture. Results suggested that membership of subsistence farmers in farmers' groups positively influences their perceptions about extension workers in meeting their information needs. In addition, the higher the level of education of subsistence farmers, the more positively they perceived extension workers. Equally, the higher the income, the more positive were the perceptions about extension workers. In addition, the nature of a farmers' major source of income and availability of income from other sources positively influence perceptions about agricultural extension workers in meeting their information needs. The years of experience and type of agriculture engaged in by subsistence farmers did not have clear influence on their perceptions about extension workers.

The major constraints subsistence farmers faced in communicating with extension workers were lack of knowledge on how to access extension workers, long distances to the sub-county and absence of extension workers. Key constraints facing extension workers included low facilitation, poor road network and low turn up of farmers for meetings. To improve the situation, subsistence farmers suggested more field visits and seminars by extension workers, recruitment of more extension workers by government, sharing telephone contacts and commitment to work. On their part, extension workers called for more facilitation for their field visits and organization of farmers into groups.

5.3 Conclusions

Despite the existence of the position of extension workers in the local government service delivery system, the interface between farmers and extension workers leaves much to be desired. There is a huge discrepancy between the information subsistence farmers need and what they actually receive from agricultural extension workers. Subsistence farmers face numerous constraints stemming from their socio-economic status including low levels of education, which make it difficult for them to know how to access an extension worker. The long distances to sub-counties are a problem probably due to inability by farmers to afford transport costs. On the other hand, extension workers also face numerous challenges mainly due to inadequate facilitation.

Barungi, Guloba and Adongo (2016) noted that implementation of the single spine extension system required Ushs 89.4 billion in its first year (2014) but only Ushs 36.77 billion (41 percent) was allocated, leaving a funding gap of up to Ushs 52.63 billion. It was predicted that because of

budgetary constraints, the farmer-to-extension-worker ratio would remain high, leading to limited out-reach. The budgetary shortfall was anticipated to hinder recruitment of adequate numbers of extension workers, facilitation of extension workers and lead to disappearance of certain specialized disciplines. Findings of this study exactly reflect this situation.

While extension workers may hold information relevant to subsistence farmers, its effective dissemination is almost unattainable. This is worsened by the fact that most subsistence farmers do not belong to groups but rather work as individuals that interact with other farmers informally; inadvertently increasing costs needed to reach them individually. It can be concluded that subsistence farmers have negative perceptions about the contribution of extension workers in meeting their information needs.

5.4 Recommendations

Basing on the study findings, there is need for interventions to address the challenges facing both extension workers and subsistence farmers:

Need for government support to extension services: In order to take full advantage of the apparently competent but encumbered extension workers, the government needs to increase their facilitation to enable them execute their mandate. There is little point in training and posting extension workers to districts but leaving them redundant and unable to serve the purpose. Provision of transport, allowances, training materials and recruitment of more staff are very important. The Ministries of Agriculture and Public Service together with Ministry of Finance, Planning and Economic Development need to carry out an assessment of the costs actually involved in implementing extension work and budget accordingly. The government should also invest in improving infrastructure in rural areas to facilitate transport and communication between extension workers and farmers.

Need for socio-economic empowerment of farmers: The government needs to continue investing in socio-economic empowerment of subsistence farmers to increase their uptake of services such as those of extension workers. Evidence from the study shows that farmers who are educated, have alternative sources of income, have high income levels and belong to groups perceive services of extension workers more positively than the poor, uneducated and non-members of farmers' groups. Introducing incentives for farmers' groups may motivate most subsistence farmers to join and benefit from the advantages of working in cooperatives.

5.5 Suggestions for future research

The researcher recommends an investigation into both conventional and traditional cost-effective communication channels, which could aid information flow between extension workers and subsistence farmers in the context of the constraints currently facing the agricultural sector.

Further, a descriptive examination of how socio-demographic characteristics of farmers influence their perceptions about extension workers could be undertaken. This may yield useful results about the approaches extension workers may need to employ to meet the needs of subsistence farmers.

In addition, institutional organization of farmers into groups should be examined further since it is proved to have a positive influence on farmers' perceptions about extension services. There is need to investigate the best approaches for supporting farmers to work together in groups and sustain them.

REFERENCES

Adhiguru, P., Birthal P. S., and Kumar B. G.. 2009. Strengthening pluralistic agricultural information delivery systems in India. *Agricultural Economics Research Review.* 22:71–79.

African Union Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa May 2014.

African Union, 2014, Department of Rural Economy and Agriculture Strategic and Operational Plan, 2014 – 2017, Fostering the African Agenda on Agricultural Growth and Transformation and Sound Environmental Management.

Agbarevo, Machiadikwe N. Benjamin, *Farmers' Perception of Effectiveness of Agricultural Extension Delivery in Cross-River State, Nigeria,* IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS) Volume 2, Issue 6 (Mar. - Apr. 2013), PP 01-07

Age A. I., Obinne C. P. O. & Demenongu T. S., Communication for Sustainable Rural and Agricultural Development in Benue State, Nigeria, Sustainable Agriculture Research Vol. 1, No. 1; February 2012.

Ahmed Hadiza Umar and Muhammad Amina, *Exploring Theory of Planned Behaviour for Understanding Agricultural Information utilization by Rural Farmers in Katsina State*, IOSR Journal Of Humanities And Social Science (IOSR-JHSS) Volume 20, Issue 6, Ver. II (Jun. 2015)

Alemu D and Demese C. 2005. The National Extension Intervention Program (NIEP) and sustainable agricultural development: An exploratory study to steer the debate on ADLI. In: Negatu W, Dadi L, Hailegebriel A, Belete S and Gebremedhin B. (eds), *Reversing vulnerability of rural livelihoods in Ethiopia: Options for sustainable development: Proceedings of the 7th annual conference of the AESE (Agricultural Economics Society of Ethiopia), Addis Ababa, Ethiopia.* AESE, Addis Ababa, Ethiopia.

Amin E. M. (2005). *Social Science Research, Conception, Methodology and Analysis*, Makerere University Press. Kampala, page, 77-81

Anderson, J. R., and G. Feder (2004). Agricultural Extension: Good intentions and Hard Realities. Romania. Lucrari Stiintifice, Seria I, Vol. XI (1). pp 291-308.

Atkin C. 1973. *Instrumental Unitilities and Information Seeking In new models for mass communication research,* edited by P Clarke. Beverly Hill,USA: Sage Pub. P 205-242.

Babbie E., 2007, The *Practice of Social Research,* Eleventh Edition, Thomson Learning Academic Resource Center.

Babu, C., Glendenning, C.J., Asenso-Okyere, K., and Govindarajan, S. K. (2011*). Farmers' information needs and search behaviors*: Case study in Tamil Nadu, India Suresh

Mildred Barungi M., Guloba M., and Adong A. (2016), Uganda's Agricultural Extension Systems: How appropriate is the *Single Spine* Structure? Research Report No. 16

Bello M., and Obinne C. P. O. (2012). *Problems and Prospects of Agricultural Information Sources Utilization by Small Scale Farmers: A Case from Nasarawa State of Nigeria,* Journal of Communication, 3(2): 91-98 (2012)

Bhagachand N Bachhav, (2012)., *Information Needs of the Rural Farmers:* A Study from Maharashtra, India: A Survey (2012). *Library Philosophy and Practice (e-journal).* Paper 866.

Bhagat, G.R., M.S.Nain, R. Narda. 2004. *Information sources for agricultural technology.* Indian Journal of Extension Education. 40:1-2, 109-110.

Bhattacherjee A., (2012), *"Social Science Research: Principles, Methods, and Practices",* 2nd edition

Birner, R., and J. R. Anderson. (2007). *How to Make Agricultural Extension Demand – Driven? The Case of India's Agricultural Extension Policy* .ISNAR/INPRI, Draft. Washington, D.C.

Britton A. H., 2011, *Factors influencing the adoption of best management practices by row crop farmers in the Suwannee valley of North Central Florida,* University of Florida

Busimbi Sub-county Five Year Development Plan (2010).

Buyinza J, Sekatuba J, Agaba H, Kinuthia, R and Kiptot, E. 2015. Analysis of Extension Systems in Uganda for Identification of Suitable Extension Approaches for Scaling-up "Trees for Food Security Project" in Eastern Uganda. NaFORRI, Kampala, Uganda/ICRAF, Nairobi, Kenya, 64pp.

Chapman, R., Blench, R., Kranjac-Berisavljevic, G. and Zakariah, A. B. T. (2003), **"***Rural radio in agricultural extension: the example of vernacular radio programmes on soil and water conservation in Northern Ghana",* Agricultural Research and Extension Network Paper, No. 127, available at: http://www.odi.org.uk/agren/papers/agrenpaper_127.pdf (accessed 16 March 2016).

Cho, K. M. and H. Boland (2003). *Toward a sustainable development in Agriculture: An analysis of training needs for extension agents in Myanmar.* Deutscher Trpentag, Oct 8-10, 2003, Gottingen, International Research on Food Security, Natural Resource Management and Rural Development, Technological and Institutional Innovations for Sustainable Rural Development.

Davis K.E., 2004, *Technology Dissemination among Small-Scale Farmers in Meru Central District of Kenya: Impact of Group Participation,* University of Florida

Demiryurek K., Erdem H, Ceyhan V, Atasever S and Uysal O. *Agricultural information systems and communication networks: the case of dairy farmers in the Samsun province of Turkey,* Ondokuz Mayıs University, Faculty of Agriculture, 55139, Samsun, Turkey, IR Information Research, VOL. 13 NO. 2, JUNE 2008

Elias A., Nohmi M., Yasunobu K., and Ishida A., *Farmers' Satisfaction with Agricultural Extension Service and Its Influencing Factors: A Case Study in North West Ethiopia,* J. Agr. Sci. Tech. (2015) Vol. 18: 39-53.

Food and Agriculture Organization of the United Nations (FAO), 2010-2011, *The State of Food and Agriculture,* Rome, 2011.

Food and Agriculture Organization of the United Nations, (1997). *Improving agricultural extension. A reference manual.* Edited by Burton E. Swanson, Robert P. Bentz, Andrew J. Sofranko

Food and Agriculture Organization of the United Nations, 2010, *Mobilizing the Potential of Rural and Agricultural Extension,* Rome, Italy.

Food and Agriculture Organization of the United Nations, 2011, *FAO Expert Consultation Communication for Development: Meeting Today's Agriculture and Rural Development Challenges,* Final Report, Rome, Italy.

Food and Agriculture Organization of the United Nations, *FAO Statistical Yearbook 2013, World Food and Agriculture.*

Food and Agriculture Organization of the United Nations, *The State of Food and Agriculture 2000*, Rome.

Gabriel Tom, 1991, The Human Factor in Rural Development, Belhaven Press, London and New York.

Galadima. M.(2014). *Constraints on Farmers Access to Agricultural Information Delivery: A Survey of Rural Farmers in Yobe state, Nigeria,* Journal of Agriculture and Veterinary Science. Volume 7, Issue 9, PP 18-22

Garry Stephenson, *The Somewhat Flawed Theoretical Foundation of the Extension Service,* Journal of Extension, August 2003 // Volume 41 // Number 4

Government of the Republic of Uganda, 2000, *Plan for Modernisation of Agriculture: Eradicating Poverty in Uganda.*

Halakatti, S.V., D.S.M. Gowda, K.V. Natikar. 2010. *Role of mass media in transfer of agricultural technologies.* Research Journal of Agricultural Sciences. 1(3):290-291.

Halinl, A and Y. Kaida (2002). *Agricultural* Extension *in the South East Asia.* Farming System Research, Bangladesh Agricultural University, Mylnensing, Bangladesh.

Harold D. Lasswell, 2007, The structure and function of communication in society, *s.215-228*

https://www.joe.org/journal-current-issue.php

Ian Christoplos, 2010, *Mobilizing the potential of rural and agricultural extension,* Food and Agriculture Organization of the United Nations.

Ibrahim H, Zhou J, Li M, Chen Q., *Perception of Farmers on Extension Services in North Western Part of Nigeria: The Case of Farming Households in Kano State,* Journal of Service Science and Management, 2014, 7, 57-62

Institute for Communication and Development, 2008, *Improving farmer livelihoods by access to information,* The Hague, The Netherlands

International Fund for Agricultural Development, 2002, *Assessment of Rural Poverty, a report, Eastern and Southern Africa,* Palombi, Rome

Jonea G. E. and Rolls M. J., 1982, *Progress in Rural Extension and Community Development,* Volume 1, Agricultural extension and rural Development Centre, University of Reading, 1982.

Kaipanyama A., 2013, *Impact of African Farm Radio Research Initiative Participatory Radio Campaigns: an Agriculture Extension Officer's Testimony,* Journal of Development and Communication Studies, Vol. 2. Nos. 2/3, July-December, 2013. ISSN (Online): 2305-7432. http://www.devcomsjournalmw.org.

Kashem, M. A (2004). *Fundamentals of Extension Education.* Lima Printing Press, Mymensingh, Bangladesh.

Kaul V., 2011, *Development Communication in India: Prospect, Issues and Trends,* Global Media Journal – Indian Edition/ISSN 2249-5835 Winter Issue / December 2011 Vol. 2/No.2

Kazi Mostak Gausul Hoq, 2012, *Role of information for rural development in Bangladesh: a sector-wise review,* Information Development 28 (1) 13–21, Sage Publications, United Kingdom.

Khalil A. H. O.Ismail M., Suandi T., Silong A.D, (2008). *Extension Worker as a Leader to Farmers: Influence of Extension Leadership Competencies and Organisational Commitment on Extension Workers' Performance in Yemen.* The Journal of International Social Research, Volume 1/4 Summer 2008

Khan, A. and M. Akram. 2012. *Farmers' perception of extension methods used by Extension Personnel for dissemination of new agricultural technologies in Khyber Pakhtunkhwa, Pakistan.* Sarhad J. Agric.28(3):511-520

Khumphicha Tantisantisom, 2011, *Information Dissemination for Farming Communities in Thailand,* Doctoral dissertation, Edith Cowan University.

Kizilaslan N. (2006) *"Agricultural Information Systems: A national case study",* Library Review, Vol. 55 Iss: 8, pp.497 – 507

Krejcie, R.V. & Morgan, D.W. (1970). *Determining sample size for research activities.* Educational and Psychological Measurement, 30, 607-610.

Krishna Reddy, & Ankaiah, 2005, ICTs for Agricultural Extension: Global Experiments, Innovations and Experiences,

Kristin Elizabeth Davis, 2004, Technology Dissemination among Small-Scale Farmers in Meru Central District of Kenya: Impact of Group Participation, University of Florida.

Kumar Rajesh, 2011, *Development Communication: A Purposive Communication with Social Conscience - An Indian Perspective,* Global Media Journal – Indian Edition/Issn 2249-5835 Winter Issue / December 2011, Vol. 2/No.2

Kumar Ranjit, 2011, *Research Methodology; A Step-By-Step Guide For Beginners,* 3rd Edition

Kumudu P. P. Kopiyawattage and Alexa J. Lamm, *Using Public Opinions of Water Quality to Provide Direction for Extension,* Journal of Extension, June 2017 // Volume 55 // Number 3 // Research In Brief

Kuponiyi, F.A. (2000), *Mass Media in Agricultural Development: The use of Radio by Farmers of Akinyele Local Government Area of Oyo State, Nigeria,* Journal of Nigerian Agricultural Development Studies.

Kwapong Afranaa Nana and Nkonya Ephraim, 2015, Agricultural Extension Reforms and Development in Uganda, *Juournal of Agricultural Extension and Rural Development, Vol 7(4), April 2015.*

Lawal I. S., Oladokun O., Kalusopa T. (2015). *The Role of Extension Workers in Akis Based Irrigation Farming in Katsina State.* International Journal of Library Science 2015, 4(2): 28-34

Lwoga, E. T., Stilwell, C., & Ngulube, P. (2011). *Access and use of agricultural information and knowledge in Tanzania.* Library Review, 60(5), 383-395.

Madushani H. D. P; *Ethical Issues in Social Science Research:* A Review. Journal of Social Statistics 2016

Maisela Edward Maepa, 2000, *Information needs and Information-seeking patterns of rural people in the Northern Province.*

Margomo T. and Sugimoto S., 2011, *Barriers of the Indonesian Extension Workers in Disseminating Agricultural Information to Farmers,* International Journal of Basic & Applied Sciences IJBAS-IJENS Vol: 11 No: 02, April 2011

Meitei, L. S., Devi, Th. P. (2009). *Farmers information needs in rural Manipur:* an assessment. Annals of Library and Information Studies, Vol 56, March 2009, pp. 35-40

Mihály Csótó1 M., *Information flow in agriculture – through new channels for improved effectiveness,* Journal of Agricultural Informatics. 2010 Vol. 1, No. 2

Ministry of Agriculture Animal Industry and Fisheries, 2012, *Agriculture Sector Performance Summarized Report.*

Ministry of Agriculture, Animal Industry & Fisheries, *Agriculture Sector Development Strategy and Investment Plan:2010/11-2014/15,* July 2010.

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Ministry of Finance, Planning and Economic Development (MFPED), *Plan for Modernization of Agriculture: Eradicating Poverty in Uganda, (not dated).*

Ministry of Agriculture, Animal Industry and Fisheries, 2009, *Ministerial Policy Statement 2009/2010*.

Ministry of Agriculture, Animal Industry and Fisheries, 2011, *Statistical Abstract*.

Ministry of Agriculture, Animal Industry and Fisheries, 2012, *Agriculture Sector Performance Summarised Report, the Second Joint Agriculture Sector Annual Review* (Jasar) 2012-1st-2nd November-Speke, Resort, Munyonyo.

Ministry of Finance, Planning and Economic Development, 2002, *Uganda participatory poverty assessment Process, The second participatory poverty assessment report,* Kampala.

Ministry of Finance, Planning and Economic Development, July 2000: *Revised Volume 1 of the Poverty Eradication Action Plan, Final Draft,* Kampala

Ministry of Finance, Planning and Economic Development, June 2012, *the Background to the Budget,* 2012/13 Fiscal Year.

Ministry of Finance, Planning and Economic Development, *Poverty Status Report, 2014.*

Mittal S., Gandhi S., Tripathi G. 2010. *Socio-economic impact of mobile phones on Indian agriculture,* Working Paper No. 246, Indian Council for Research on International Economic Relations.

Mityana District, 2010, *District Five-Year Development Plan for 2010-2015*.

Mugumya Firminus, 2013, *Enabling Community-Based Water Management Systems: Governance and Sustainability of Rural Point-water Facilities in Uganda, PhD Thesis,* School of Law and Government, Dublin City University.

Mwaura, Francis; Muwanika, Fred Roland; and Okoboi, Geofrey, *Willingnes*s to pay for extension services in Uganda among farmers involved in crop and animal husbandry, Contributed Paper presented at the Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23, 2010.

Narayana M.R., 2013, *Management of Coffee Leaf Rust Disease in India: Evidence For Channels of Communication,* Journal of Applied Communications, Volume 97, No 3. pages 71-84.

National Planning Authority, *National Development Report, 2010/2011*

New Partnership for African Development (NEPAD), November 2013, *African agriculture, transformation and outlook*, Johannesburg 1685, South Africa.

Obuh *J, Effectiveness of Communication Outreach Strategies of Extension Agents, Global Approaches to Extension Practice* Vol. 3 (2) 2007: pp. 152-155

Oladele O. Idowu, *Farmers' perception of agricultural extension agents' characteristics as factors for enhancing adult learning in Mezam division of Northwest Province of Cameroon,* Australian Journal of Adult Learning, Volume 45, Number 2, July 2005

Ozor, N. (2010). *A Comparative Analysis of the Alternative Approaches in the Provision of Agricultural Extension Service.* Journal of Agricultural Extension. Vol. 14 (1): 31-47.

Ozowa, V. N., *Information Needs of Small Scale Farmers in Africa: The Nigerian Example.* Consultative Group on International Agricultural Research, Volume 4, Number 3, June 1997

Purcell D. L and Anderson J R. 1997. *Agricultural research and extension: Achievements and problems in national systems.* World Bank Operations Evaluation study, World Bank, Washington, DC, USA.

Rees D., Momanyi M, Wekundah J., Felister Ndungu, Jacob Odondi, A. O. Oyure, Dymphina Andima, Marion Kamau, Jessica Ndubi, Francis Musembi, Lucy Mwaura and Rita Joldersma, 2000. *Agricultural Knowledge and Information Systems in Kenya – Implications for Technology Dissemination and Development,* Network Paper No. 107.

Riesenberg, L. E., & Gor, C. O. (1989*). Farmers preferences for methods of receiving information on new or innovative farming practices.* Journal of Agricultural Education, 7-13.

Rivera, W.M. and W. Zijp (Eds.), Contracting for Agricultural Extension: International Case Studies and Emerging Practices: CABI Publishing, New York, 2002.

Rogers E. M, Third Edition, 1983, *Diffusion of innovations,* The Free Press, New York, United States of America.

Sailas Nyareza and Archie L. Dick, *Use of community radio to communicate agricultural information to Zimbabwe's peasant farmers,* Research paper, Department of Information Science, University of Pretoria, Pretoria, Republic of South Africa.

Saliu1 J. O., Obinne P. C. and Audu S. I., (2009). *Trends in agricultural extension services in Africa: Option for new approaches.* Journal of Agricultural Extension and Rural Development Vol. 1(3). pp. 071-076, December, 2009

Siatri, Rania. (1999). *Evolution of user studies.* Libri, 49, 132-141.

Singh, B. 1990. *Socio-personal correlates of adoption behaviour and information needs of tribal farmers in respect of rainfed technology.* Indian Journal of Extension Education. 26: 3-5, 53-58

Singh, B., Narwal R.S, Malik J.S.. 2003. *Communication sources used by extension personnel and farmers.* Indian Journal of Extension Education. 39:1-2, 26-30.

Siyao , Peter., O (2012). *Barriers in Accessing Agricultural Information in Tanzania With a Gender Perspective: The Case Study of Small-Scale Sugar Cane Growers In Kilombero District, EJISDC* , 51, 6, 1-19

Solomon, Uganneya Dr.; Rebecca, Ape Dr.; and Julie, Udensi Dr., *Agricultural Research Information System Of Nigeria: An Assessment Of Institutional Effectiveness* (2013). Library Philosophy and Practice (e-journal).Paper998.

Suresh , J., Kwadwo ,A., and Senthil G.(2011). *Farmers' information needs and search behaviours: Case study in Tamil Nadu, India.* International Food Policy Research Institute

Swanson B E, Farner BJ and Bahal R. 1990. *The current status of agricultural extension worldwide.* In: Swanson BE. (ed), Report of the global consultation on agricultural extension. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.

Terry, B. D. and Israel, G. D., (2004), *Agent Performance and Customer Satisfaction*, Journal of Extension, Dec 2004, Vol. 42, No. 6. Online: http://www.joe.org/joe/2004december/a4.shtml

Tesfaye A.M., 2013, *Using Community Conversation in the Fight against HIV and AIDS,* Journal of Development and Communication Studies pp. 344-357 Vol. 2. Nos. 2/3, July-December, 2013. ISSN (Online): 2305-7432.

Tiwari, K.R., I.L.P. Nyborg, B.K. Sitaula, and G.S. Paudel. 2008. Analysis of the Sustainability of Upland Farming Systems in the Middle Mountain Region of Nepal. International Journal of Agricultural Sustainability 6 (4): 289-306.

Tom G., 1980, *Understanding the Local Social Conditions in Extension Training, Reading, Agricultural Extension and Rural Development Centre,* University of Reading.

Tom G., 1991, *The Human Factor in Rural Development,* Belhaven Press, London and New York.

Tumsifu E , Silayo E.E , (2013) *"Agricultural information needs and sources of the rural farmers in Tanzania: A case of Iringa rural district",* Library Review, Vol. 62 Iss: 8/9, pp.547 - 566

Uddin M, N. (2008). *Agricultural Extension Services in Bangladesh: A Review Study.* Bulletin of Institute of Vocational and Technical Education, No.5

Uganda Bureau of Statistics, 2013, *The Uganda National Household Survey, 2012/2013.*

Uganda Bureau of Statistics, 2014 statistical Abstract, November 2014.

Uganda Bureau of Statistics, Ministry of Agriculture, Animal Industry and Fisheries, *Uganda Census of Agriculture2008/2009,* Volume IV: Crop Area and Production Report.

Uganda National Farmers Federation (UNFFE): *Exploring new alliances in agricultural extension,* LEISA MAGAZINE. JULY 2002

Valdivia, C. (2001). *Gender, Livestock Assets, Resource Management, and Food Security: Lessons from the SR-CRSP, Agriculture and Human values,* 18, 27-39.

VidanapathiranaP. Nisansala, 2012, *Agricultural information systems and their applications for development of agriculture and rural community, a review study,* University of Turku, Turku School of Economics, Finland.

Von Billow, D. & Sorensen, A. (1993). *Gender and Contract Farming: Tea Outgrowers Schemes in Kenya.* Review of African Political Economy; March 1993.

Youdeowei, A. and Kwarteng, J. (1995). Development of Training Materials in Agriculture. A Course Manual. Sayce Publishers, U. K.

Zeitlyn Jonathan, 1992, Appropriate Media for Training and Development, 2nd edition, TOOL Publications, Cornell University.

APPENDICES

APPENDIX 1: Interview Guide for subsistence farmers

Questionnaire number: …….

Date:…….

Village:.....

Parish: .....

Introduction:

Good morning/afternoon sir/madam . Thank you for making time to talk to me and share your rich experiences about the effectiveness of agricultural extension workers in satisfying the information needs of farmers in Busimbi Sub-county, Mityana district. My name is Nnamulondo Proscovia a student from the College of Humanities and Social Sciences of Makerere University; and (***OR in case of Research Assistant:*** **My name is……..and I am carrying out a study on behalf of Nnamulondo Proscovia, a student of…).** This is an academic study but results will be shared with local government officials and agricultural extension workers in the district. They may use them as reference in their future agricultural programs.

You were selected because of your experience in farming matters in Busimbi Sub-county, Mityana district. Please feel free to share your point of view because there are no wrong answers but rather alternative points of view. I assure you of utmost confidentiality and your name will not be mentioned in the report.

SECTION A: RESPONDENT'S PERSONAL DATA

1. Gender of respondent: 1) Male 2) Female

2. What type of agriculture are you engaged in?

   1) Crop growing 2) Animal keeping including poultry 3) Mixed farming (crop and animal)

   4) Fishing 5) Others (specify)
   .....

3. What crops do you grow?

   1) Maize 2) Sweet potatoes 3) Bananas 4) Beans 5) Cassava

   6) Coffee 7) Others (Specify).....

4. What animals do you keep?

1) Goats 2) Cows 3) Pigs 4) Chicken 5) Rabbits

6) Others (Specify .....

5. For how long have you been engaged in agriculture?

1) 1-2 years 2) 3-5 years 3) 6-10 years 4) more than 10 years

6. Are you a member of any farmers' group?

1) Yes 2) No

7. What level of education (formal) did you attain?

1) None
2) Primary
3) O level (senior 1-4)
4) A level (senior 5-6)
5) Diploma holder
6) First degree holder
7) Other (specify) ……

8. What is your major source of income?

1) Crop produce 2) Livestock 3) Petty trade

4) Casual labour 5) Others (specify) .....

9. How much money do you earn from agriculture every month?

1) Less than shs50,000 2) shs500,001- shs100,000 3) sh100,001shs - 150,000 4) shs150,001 – shs 199,999 5) shs200,000 and above

SECTION B: INFORMATION NEEDS OF SUBSISTENCE FARMERS

1. What information do you need as a subsistence farmer to carry out your work and improve it?

1) Modern farming practices 2) Agricultural financing opportunities
3) Good seed varieties 4) Fertilizer application 5) Pests and disease control
6) Crop prices 7) Others (specify) .....

SECTION C: WHETHER EXTENSION WORKERS HAVE THE INFORMATION NECESSARY TO SATISFY INFORMATION NEEDS OF SUBSISTENCE FARMERS

1) What do you consider to be your major source (a person /channel) of information about agriculture?

   1) Spouse 2) Friend 3) Extension worker 4) Traders

   5) Farmers group members 6) Radio 7) Others (specify)……...

2) Have you ever met the extension workers in your sub-county?

   1) Yes 2) No

3) Is information about agriculture readily availed to you by extension workers at the time you need it? 1) Yes 2) No

4) Is the information you receive from extension workers about agriculture relevant to your work?

   1) Yes 2) No

5) How has the information from agricultural extension workers helped you in your work?

   ……

   ……

   Does the information provided by extension workers satisfy all your information needs about agriculture? 1) Yes 2) No

SECTION D: ADEQUACY OF CHANNELS OF COMMUNICATION USED BY EXTENSION WORKERS IN DISSEMINATING INFORMATION TO SUBSISTENCE FARMERS

1) What channels are used by extension workers to disseminate information to you?

   1) Meetings/seminars 2) Practical demonstration sessions 3) Mass media 4) Printed material (Posters, newsletters, leaflets, etc) 5) Telephone

   6) Others (specify) .....

2) How do you rate the affordability of the channels used by extension workers to disseminate agricultural information to you?

   1) Very affordable 2) Somewhat affordable 3) Not affordable

3) How do you rate the accessibility of the channels used by extension workers to disseminate agricultural information to you?

   1) Highly accessible 2) Somewhat accessible 3) Not accessible

4) What is your comment on the duration of time allocated by extension workers to give information to farmers?

.....

5) What is your comment on the time of the day agricultural information is disseminated to you by extension workers?

.....

.....

6) What channels would you prefer to receive agricultural information from extension workers?

   1) Meetings/seminars 2) Practical demonstration sessions 3) Mass media 4) Printed material (Posters, newsletters, leaflets, etc) 5) Telephone

   6) Others (specify) .....

SECTION E: CONSTRAINTS FACED BY EXTENSION WORKERS AND SUBSISTENCE FARMERS IN EXCHANGING INFORMATION ON AGRICULTURE

1) What is the major constraint you face in exchanging information with extension workers?

   1) There are no extension workers 2) I do not belong to a farmers' group

   3) I don't know how to access the extension worker 4) Long distance to the sub-county 5) Extension workers are too busy

   6)Others (specify)……

2. How can communication between you as a farmer and extension workers be improved to enable you do your agricultural work better?

.....

.....

That concludes our interview. Thank you so much for sharing your thoughts and opinions with me.

APPENDIX 2: Interview Guide for Agricultural Extension Workers

Introduction

Good morning/afternoon/evening Sir/Madam.

My name is Nnamulondo Proscovia. I am a student of Makerere University pursuing a Masters Degree in Social Sector Planning and Management. I am carrying out a study on **the** effectiveness of agricultural extension workers in satisfying the information needs of subsistence farmers in Busimbi Sub-county, Mityana District**. All** the information that will be obtained during this study will be treated as confidential and will only be used for academic purposes. No identification information about you will be revealed to anybody at any stage of this study. I request you to participate in this study by responding to the questions I am going to ask you. Thank you.

SECTION A: PERSONAL DATA

1. For how long have you worked as an agricultural extension worker?
2. What is your current duty station? (probe: district or sub-county)
3. What information do you think subsistence farmers need to engage in productive farming? (Probe: variability of information needs)
4. How do farmers access the information they need to engage in productive farming (probe: sources of information)
5. What channels do you use to disseminate information to subsistence farmers? (probe: interpersonal, mass media, modern media, multiple channels)
6. How do you ensure that information on agriculture reaches subsistence farmers? (Probe: language, time, duration, accessibility, affordability)
7. What factors determine how often you meet subsistence farmers in your sub-county? (probe: facilitation, policy, frequency of meetings, farmers' attitudes, seasons)
8. What constraints do you face in exchanging information with subsistence farmers? (Probe: illiteracy among farmers, technical language, distance, poverty, policy, cost)
9. How can communication between you as an extension worker and subsistence farmers be improved to enable them engage in productive farming? (probe: policy, facilitation)

That concludes our interview. Thank you so much for sharing your thoughts and opinions with me. If you have additional information that you did not get to say in the interview, please feel free to call me on the telephone number I will provide shortly.