

**ASSESSMENT OF AGRICULTURAL EXTENSION OFFICERS' PERCEPTIONS
ON THEIR ROLES: A CASE STUDY OF AGRICULTURAL EXTENSION
OFFICERS' IN SIMIYU REGION**

MKUKI, ZAHARA HASSAN

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN
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2020ABSTRACT

This study was conducted to assess agricultural extension officers' (AEOs) perception on their roles as per government job description in five districts in Simiyu Region. Specifically, the study aimed at identifying roles performed by AEOs, determining AEOs awareness on their roles, determining AEOs self-assessment on their role competence, determining factors influencing AEOs perception on their roles and evaluating the opinions of AEOs in relation to their roles. The roles of AEOs were grouped into seven categories, which included: facilitation, organizational, intermediation, educational, technical, advisory and administrative. Using a cross-sectional research design, a sample of 100 AEOs at ward and village levels were randomly selected for the study and self-administered questionnaire was used to collect data. Statistical Package for Social Science (SPSS) was employed as a tool for data analysis, where frequency and percentage were used to describe distribution of the study variables. Three Focus Group Discussion (FGDs) each comprising of eight members were conducted, which involved agricultural officers at the district levels including the District Agricultural Irrigation and Cooperative Officers (DAICOs). The study findings revealed that majority of the AEOs were aware about most of their roles: advisory; educational; organizational; facilitation; intermediation and technical, but least perceived awareness was the administrative role. AEOs reported to perform advisory and educational roles; furthermore, study findings showed that most of the AEOs had competence in performing advisory roles. However, they had low competence on educational, organizational, technical, facilitation, intermediation and administrative. Also, AEOs perceived advisory, organization, educational, technical, facilitation and intermediation roles as important. The multiple regression model showed that factors that statistically significantly influenced perception of AEOs about their roles were: mode of supervision ($p \leq 0.048$) at $p \leq 0.05$; owning transport ($p \leq 0.004$) at $p \leq 0.05$;

type of transport ($p \leq 0.010$); promotion in the organization ($p \leq 0.001$); responsibility ($p \leq 0.010$), and appreciation ($p \leq 0.001$). For these study findings, recommendations include regular training of AEOs and provide support in terms of infrastructure for the AEOs such as transportation including fuel, allowances, office space and teaching aid for effective and efficiency role performance.

DECLARATION

I, MKUKI ZAHARA HASSAN, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

.....

MKUKI, Zahara Hassan

(MSc. student)

.....

Date

The above declaration is confirmed by;

.....

Prof. Catherine P. Msuya

(Supervisor)

.....

Date

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DEDICATION

I am extremely grateful to dedicate this work to my lovely parents; my father Mr. Hassan Mkuki, my mother Fatuma Omary for their guidance and prayers in my life, and my lovely son Ibrahim.

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LIST OF ABBREVIATIONS

AEOs	Agricultural Extension Officers'
ASDP	Agricultural Sector Development Programme
DAICOs	District Agricultural Irrigation and Cooperative Officers
FAO	Food and Agriculture Organization of the United Nation
FGDs	Focus Group Discussions
NBS	National Bureau Of Statistics
NGOs	Non-Governmental Organizations
SAGCOT	Southern Agriculture Growth Corridor of Tanzania
SNAL	Sokoine National Agriculture Library
SPSS	Statistical Package for Social Sciences
TASAF	Tanzania Social Action Fund
TFSIP	Tanzania Food Security Investment Plan
URT	United Republic Of Tanzania
VAEOs	Village Agricultural Extension Officers
VEOs	Village Executive Officers
WAEOs	Ward Agricultural Extension Officers
WEOs	Ward Executive Officers

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

In most developing countries smallholder farmers are the foundation of agricultural and food value chains. In Tanzania for example, with an estimated population of 52 554 628 people (NBS, 2018), the agriculture sector employs about two thirds of the total employed persons, and almost 90% of those employed in the sector are smallholder farmers living in rural areas.

Services including agricultural extension, research, and training play pivotal roles in linking farmers to new technologies, information and knowledge that are central in enhancing agricultural production (URT, 2015). In Tanzania, the extension services are mainly provided by the government with minimal collaboration with the private sector, faith-based organizations, and other non-governmental organizations (NGOs) (Rutatora and Mattee, 2001). The Government has developed a number of programmes such as Agricultural Sector Development Programme ASDP I and ASDP II, *Kilimo Kwanza* initiative, Tanzania Food Security Investment Plan (TAFSIP), Southern Agriculture Growth Corridor of Tanzania (SAGCOT) and others, all aimed at creating an enabling environment for ensuring improved extension service delivery for improving agricultural production, household food security, profitability, farm incomes and alleviating rural poverty (URT, 2013). In addition, the government has pursued efforts to increase the number of agricultural extension officers.

By year 2014, there were 9 139 field agricultural extension officers spreading across the country in 168 LGAs (URT, 2015) mandated to perform various roles. According to

Scheme of Service for Local Government Authorities (Compiled version from 2002-2011) AEOs roles includes facilitating formation of farmers groups and advising on making better decisions to increase agricultural production; promoting collaboration in the implementation of agricultural projects and programs; ensuring good relations/communication between research centres and farmers; cooperating with non-governmental organizations and organizations involved in crop production, processing and marketing (URT, 2011). However, agricultural extension officers' perception on their mandated roles as it is not well known.

1.2 Problem Statement

Despite the government's efforts to improve the agricultural extension service delivery to improve specifically smallholder agricultural production and other aspects of the value chains, these efforts have not shown positive outcomes to farmers (Ragasa *et al.*, 2013). This is due to the fact that the smallholder farmers produce low yields, suffer from the problem of post-harvest handling, processing and poor access to markets that adversely affect their livelihood Magesa *et al.* (2014). For example, in 2019, the average productivity of seed cotton in Tanzania was around 300 kilogrammes per acre, which was the only 20% of its potential productivity (Chami, 2018). Potentially, cotton productivity in Tanzania can reach 1500 kg per acre. Also, Magesa *et al.* (2014), revealed that farmers sell their produce at farm or at home mainly due to lack of market information. This information could actually be provided by agricultural extension officers.

Several studies have assessed the status of agricultural extension service delivery, and some include that of Magesa *et al.*, (2014) who assessed factors influencing agricultural extension service delivery effectiveness. Yet, Msuya *et al.* (2017) assessed smallholder farmers' agricultural market information and challenges facing agricultural extension

personnel. Furthermore, Komba *et al.* (2018) examined socio-economic factors influencing farmers perception on the effectiveness of agricultural information and service delivery. Maoba (2016) studied on farmers' perception on agricultural extension services delivery in Germiston, Gauteng Province in South Africa. However, little is known on agricultural extension officers' perception on their roles as per government job description, which this study intends to fill the gap.

1.3 Justification of the Study

Understanding of the agricultural extension officers' perception on their mandated roles will help to come up with strategies that will be recommended to policy makers and planners for addressing these perceptions. Also, by determining agricultural extension officers' level of awareness and competence will improve their performance in delivering agricultural extension services to smallholder farmers. These will in-turn assist extension officers to have positive attitudes towards their work, perform their work as mandated and ultimately improve extension service delivery for improvement of agricultural production in the country (Dube, 1993).

1.4 Research Objectives

1.4.1 General objective

The general objective was to determine agricultural extension officers' perceptions on their roles in five districts of Simiyu Region.

1.4.2 Specific objectives

1. To assess agricultural extension officers' level of awareness on their roles as per the government job description.
2. To identify roles performed by extension officers in Simiyu Region.

3. To examine agricultural extension officers' self-assessment on the level competence in performing their roles as per the government job description.
4. To determine factors influencing extension officers' perception on their roles.
5. To evaluate the opinions of agricultural extension officers in relation to their roles as per the government job description.

1.5 Theoretical Framework

According to Biddle (1979), role theory is a science concerned with the study of behaviors that are characteristic of persons within contexts and with various processes that presumably produce, explain, or are affected by those behaviors. Role theory concerns one of the most important features of social life, characteristic behavior patterns or roles. It explains roles by presuming that persons are members of social positions and hold expectations for their own behaviors and those of other persons (Biddle, 1986).

Kunwar (1989) stated that roles regard that persons are members of social positions and hold expectations for their own behaviors and those of other persons. However, Newcomb (1951) had stressed that role and position are inseparable in that a position is meaningless without its accompanying role. Therefore in an organization, agricultural extension officers possess different positions in executing their roles.

Globally agricultural extension officers (AEOs) face similar challenges in performing their duties; however, there may be some few discrepancies between AEOs in developed and developing countries (Negera, 2014). Due to differences which exist among AEOs they may be in position to influence their work performance and perception on their roles. Negera (2014) observed that wages, incentives, reward, job stress, mentoring programs,

trainings, and recognition are some of the factors affecting AEOs performance. Therefore, organization from which AEOs are supervised must develop conducive environment for them to implement their roles effectively and timely. Supervision always enhances positive outcome of job performed and facilitates evaluation. Bernard and Goodyear (2004) state that supervision is the relationship between senior and junior member(s) of a profession that is evaluative, serves to enhance the skills of the junior person, and monitors the quality of the services offered by the junior person, and acts as gate keeping to the profession.

1.6 Conceptual Framework

The conceptual framework of this study (Fig. 1) illustrates the independent and dependent variables. The variables show the framework of the study on assessment of AEOs perceptions on their roles. Independent variables include: Age, education qualification, work experience, motivation, competence, working environment, wages, incentives, reward, job stress, mentoring programs, training and awareness on their roles, while dependent variable is perceptions of AEOs on their roles.

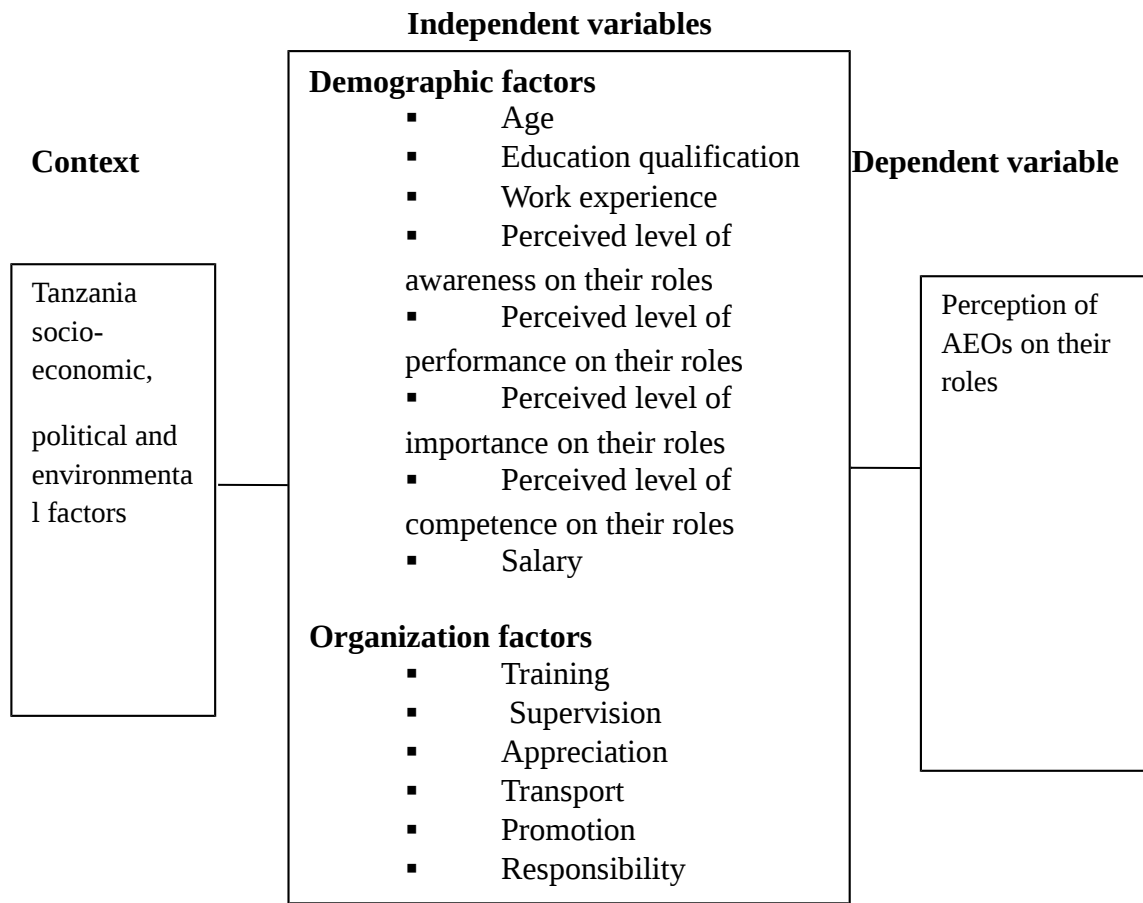


Figure 1: The conceptual framework of the study

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 An Overview of Agricultural Extension

The definition of agricultural extension has been viewed differently by different scholars. The traditional view of agricultural extension in Africa was much focused on increasing production, improving yields, training farmers, and transferring technology (Davis *et al.*, 2010). Today's agricultural extension is viewed as a system that facilitates access of new knowledge, information and technologies to smallholder farmers and that promotes interaction with research, education agencies, agri-businesses, and other relevant institutions aiming at developing farmers' own technical, organizational, managerial skills and good agricultural practices (Christoplos, 2010).

Furthermore, Birner *et al.*, (2006) viewed agricultural extension services as the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems related to obtaining knowledge, information, skills, and technologies for improving their livelihood. According to Anaeto *et al.*, (2012) agricultural extension is an educational process that brings about desired behavioral change to farmers.

2.2 Roles of Agricultural Extension Officers

According to McLagan (1989) role is a major area of functioning which encompasses any number of competencies and outputs that a person can perform. Also role may be defined as a set of norms, values and interaction patterns associated with a given category of individuals (Anaeto *et al.*, 2012). In daily life every individual performs different roles in a community in which he/she must be aware of what exactly is needed.

Traditionally, the role of agricultural extension services has been viewed as simply to transfer technology from research to farmers for increasing production, but this perception

has however changed over the years. According to (Davis *et al.*, 2010) currently agricultural extension goes beyond technology transfer to facilitation; beyond training to learning, and includes assisting farmer to form groups, dealing with marketing issues, and partnering with a broad range of service providers and other agencies.

Furthermore, AEOs serves as an administrative leader and coordinator for formulating, developing, implementing and evaluating agricultural extension programmes as well as developing farmers in managing resources in the rural areas. Success of agricultural extension officers depends on their ability to optimize resources and motivate farmers to acquire a positive desire for achieving the desired level of performance (Dubrin, 2007; Chimanikire *et al.*, 2007) as cited by Mbega (2015). This is in line with Chisita (2010) who contend that extension officers play a critical role in providing agricultural professional services, farmer training, advisory and technical support to farmers. Suvedi and Kaplowitz (2016) argue that agricultural extension officer's role is not merely about educating rural people to attain physical and economic prosperity - it involves a holistic development of the people in rural, suburban and urban areas. According to Anaeto *et al.* (2012) the role of agricultural extension in national agricultural development is pertinent. It has been established that no nation will have real growth in the agricultural sector without effective agricultural extension services.

Change in AEOs roles has been caused by rapid changes that are taking place in the agriculture sector like shifting from subsistence to commercial farming, emphasis on value chain development, climate change, changes in consumer demand due to urbanization, technological changes and increase in economic growth creating an increasing demand for different agricultural products (Swanson, 2008). Therefore, AEOs are expected to assist

smallholder farmers in a number of roles including in how to sell their produce, buy seedlings and control of pests, all in an effort to fight food insecurity (Sani *et al.*, 2014).

In Tanzania, also the roles of AEOs have increased trying to help smallholder farmers to compete in agriculture globally. According to Suvedi and Kaplowitz (2016) stated that AEOs roles can be grouped into two broad categories; process and technical skills. However, Agricultural for Impact (2015) AEOs roles were categories as technology transfer roles, advisory roles, and facilitation roles. Also, Moris (1987) as cited by Mattee (1994) grouped AEOs roles into two categories namely educational and advisory. Given the literature review and the author's experience, the seven categories of roles were formulated to help in understanding the AEOs perception on their roles. The seven role categories developed were: facilitation, organizational, intermediation, educational, technical, advisory and administrative roles. These are defined as follows.

Facilitation: According to Kitson *et al.*, (1998) facilitation is defined as a “technique by which one person makes things easier for others”. They further say that facilitation is the role category that describes the type of support required to help people change their attitudes, habits, skills, ways of thinking, and working. For this study, facilitation was defined as the process of helping/supporting smallholder farmers in accessing various services such as inputs, credit and markets individually or in group bases.

Organizational: means establishing structures and systems through which activities are arranged, defined and coordinated in terms of some specific objectives (Anaeto *et al.*, 2012).

Intermediation: According to Koutsouris (2012) means bridging the gap between two or more parts. It aims at making sure that there is a link between the parties in which both parts benefits from such connection.

Educational: Means bringing about change in the behavior, attitude and skills of the people which usually is done by using a systematic and planned method, utilizing the basic principles of teaching and learning (Anaeto *et al.*, 2012).

Technical: These are usually practical roles where specialists examine situations, recognize and understand the problems and opportunities and propose courses of action (Kahan, 2013). For example, if a farmer is experiencing low income or low profitability, the specialist should be able to diagnose the situation, identify the cause of the problem and then recommend corrective actions.

Advisory: In agricultural extension advisory services, this means supporting farmers to solve their own problems now and in the future (Christoplos and Kidd, 2000).

Administrative: For this study, administrative roles category included roles that were not in AEOs job description.

Job description of agricultural extension officers in Tanzania

In realizing the increased roles in agricultural extension service delivery, in Tanzania also AEOs are mandated to perform various roles as per their job description. The roles as stipulated in their job description have also increased as they struggle to support farmers to take benefit of opportunities for improving profitability. Agricultural extension officers are mandated to execute various roles including facilitating farmers group formation and advice in making better decisions to increase agricultural production; promoting collaboration in the implementation of a projects and programs; ensuring good

relations/communication between research centre and farmers; cooperating with non-governmental organizations and organizations involved in crop production, processing and marketing; educate farmers on good agricultural practices and advice on the use of modern agricultural equipments/implements; identify the sources of water and develop strategies for conservation in the community; provide advice on diversified agriculture and engaging researchers in conducting experimental plots, and participating in evaluating the performance for effective advice of farmers (URT, 2011). This study therefore, intended to assess AEOs perception on their roles as mandated in their job descriptions.

2.3 The Concept of Perception

Perception is “the process by which individuals receive information or stimuli from the environment and transform it into psychological awareness” (Van den Ban and Hawkins, 1996). Danijela *et al.* (2011) defined perception as the “conscious recognition and interpretation of sensory stimuli that serve as a basis for understanding, learning, and knowing, or for motivating a particular action or reaction.

Furthermore McShane and Von Glinow (2015) as cited by Manik and Sidharta (2017) described perceptions as the process of receiving information and making it acceptable. Perception can shape a person's thoughts and behavior as not all information received can be accepted by individuals. Therefore, understanding AEOs role perception it will help to know what AEOs believes on their roles as it have been mention before by Ibrahim *et al.* (2008) that role perception has great impact in job performance . McShane and Von Glinow (2015) defined role perceptions as the extent to which a person understands the job duties assigned. Also Manik and Sidharta (2017) stated that role perception help employees to understand better their work and do the job as good as possible. For this study, perception refers to beliefs that AEOs hold regarding their roles, and were measured

using a Likert-scale type questions, where respondents were asked to indicate their views to determine whether or not they held the correct perception on their roles. According to Bernard (1994), Likert-scale type of interview items results in a single score that represents the degree to which a person is favorable or unfavorable responding with respect to the question asked.

Factors influencing perception

According to Mcharo (2013) farm size and household size, education level, farm experience and frequency contact with AEOs had positive effect, while age of respondents showed negative effect on perceived effectiveness of AEOs in knowledge transfer due to the inability of aged respondents in accessing information on farm inputs. Also, farmers participation in extension programs and level of awareness of AEOs about extension services have been reported by Ibrahim *et al.* (2014) as factors influencing perceptions which help to create demand-driven extension services to farmers.

Bortamuly (2015) in a study on the role performance of the agricultural extension personnels revealed that service experience, training exposure, role awareness, role perception, attitude, achievement motivation, motivational climate and job satisfaction had positive contribution toward the overall role performance of the agricultural extension personnel. However, for optimum performance of agricultural extension agents, adequate positive role perception should be accompanied by other factors such as resource availability, transportation, training, promotional opportunities and other incentives for increasing the impact of extension agents (Kumar *et al.*, 2013). Negara (2014) found that motivation was positively influenced by work incentives, job security, job description, supervision systems, performance appraisal, policy environment of extension organizations and attitudes towards their jobs. However, motivation was negatively

influenced by work location. Perception therefore, has a greater impact to an individual based on his/her position.

CHAPTER THREE

3.0 METHODOLOGY

This chapter describes the methodology used for obtaining and analyzing data relevant to this study. This chapter includes a description of the study areas, justification for choosing Simiyu Region, research design, sampling frame, study population, sample size, sampling procedures, data collection, and data analyses.

3.1 Description of the Study Areas

This study was conducted in Simiyu Region, which comprises five districts namely Maswa, Meatu, Itilima, Bariadi and Busega. The region experiences temperatures ranging from 18°C to 31°C with an average rainfall from 600 mm to 900 mm. And the region has a total area of 23 807.7 square kilometers, where 11 479.10 square kilometers are suitable for agriculture and pastoral activities (Simiyu Region Socio-economic Profile, 2019). It is bordered by Manyara and Singida Regions to the east, Shinyanga Region to the south, Mwanza Region to the west and Mara Region to the north. In the eastern and part of northern border lies the Serengeti and Ngorongoro National Parks. The major activities include small-scale farming of food and cash crops such as maize, sorghum, millet, sweet potatoes, groundnuts and paddy, cotton and livestock keeping. This study could be conducted in any region as AEOs are located all over the country. However, Simiyu Region was selected due to the researcher's familiarity of areas within the region which were easily reached and cost effective.

3.2 Research Design

A cross-sectional survey design was used in this study because of the nature of the study intended to collect data once from the respondents. Babbie (1990) proposes that cross-sectional research design is suitable for describing study purposes where data is collected at a single point in time. The design is also considered favorable due to limited resources like finance, time, and manpower for collecting data.

3.3 Study Population

The study population comprised of all 183 AEOs working in Simiyu Region.

3.4 Sampling Frame, Sampling Procedure and Sample Size

The sampling frame for this study was a list of all wards and villages that had AEOs in Simiyu Region. The sampling frame comprised of 130 AEOs that worked at the ward and village levels in Simiyu Region as 53 worked in at the district headquarters. Hence, using Krejcie and Morgan (1970) sample size Table, the sample size of this study was determined as 100 out of the 130 AEOs. As supported by Wooldridge (2008), a sample or sub-sample of 30 respondents is the minimum for studies in which statistical data analysis can be done. A sample size of 100 AEOs was proportionally and selected randomly from the five districts (Table 1).

Table 1: Distribution of AEOs in the study wards and villages

Name of the district	Total AEOs in the wards and villages	Ratio	Sample size	Percentage
Maswa	35	$35/130*100$	27	27
Itilima	23	$23/130*100$	18	18
Bariadi	22	$22/130*100$	17	17
Busega	20	$20/130*100$	15	15
Meatu	30	$30/130*100$	23	23
Total	130		100	100

3.5 Primary and Secondary Data Collection

The primary data was collected from AEOs at ward and village level by using a structured questionnaire. Data for objectives One, two, three, and four were collected using the Likert-scale type of questions. Three focus group discussions (FGDs) were conducted in Maswa, Itilima and Busega Districts, which involved eight agricultural officers at the District level including the District Agricultural Irrigation and Cooperative Officers (DAICOs) to supplement quantitative data collection. Secondary data for this study was obtained from various sources such as reports from regional and district agricultural offices, journals, websites and Sokoine National Agriculture Library (SNAL).

3.6 Data Analysis

The quantitative data collected was coded and summarized prior to the analyses by using the Statistical Package for Social Sciences (SPSS) version 16.0 computer program. Descriptive analysis consisted of frequencies and percentages, which were used to report data. Qualitative data was analyzed using content analysis techniques where emerging themes from FGDs were identified, described and discussed.

Multiple linear regression was used to determine factors influencing AEOs perception on their roles. The multiple regression equation used for analysis was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon,$$

Where;

Y= AEOs perceptions score on their roles (Total scores for response on all the 36 statements)

β = Regression coefficients.

β_0 = Intercept.

$X_1 \dots X_n$ are explanatory variables sex (1=Male 0=Female); education level (0= Certificate, 1=Diploma, 2=Bachelor, 3=Masters); working experience (Years); attending on job training (1=Yes, 0=No); mode of supervision (1=He/she visit me at my working station, 2=I meet with him or her at district headquarter, 3= I just prepare my report and send it to him/her); Number of visit (0=once per month, 1= twice a month, 2=three times a month, 3=four times a month); whether has transport (1=Yes, 0=No); means of transport (0=Walking, 1=Bicycle, 2 =Motorcycle); nature of work (5 = strongly agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); promotion in an organization (5 = strongly agree, 4= Agree, 3 Undecided, 2=Disagree, 1=Strongly disagree); responsibility (5 = strongly agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); appreciation for work (5 = strongly agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); Salary (5 = strongly agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); working condition Salary (5 = strongly agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); relationship with supervisor (5 = strongly Agree, 4= Agree, 3 Undecided , 2=Disagree, 1=Strongly disagree); and relationship with peer (5 = strongly Agree, 4= Agree, 3 Undecided, 2=Disagree, 1=Strongly disagree).

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

This section presents the findings of the background information of the respondents and the agricultural extension officers (AEOs) perception towards their roles namely; facilitation, organization, intermediation, educational, technical, advisory and administrative roles. The extension officers perception of components of each role is presented first followed by average perception each role. The study went further to investigate the general perception of extension officers towards the extension work.

4.1 General Information

The discusses the background information of the agricultural extension officers (respondents) who participated in this study. The information collected included sex, age, work station, educational levels, area of specialization and work experiences.

4.1.1 Sex, age and work station of the respondents

The study results presented in Table 2 shows that, majority 88% of the respondents were males and only 12% were females. This implied that male dominated females in the selected sample, a trend found mostly in many developing countries. For example, studies done by Idrisa and Ogunbamaru (2012) in Nigeria showed that the majority (80%) of agricultural extension officers were males, while only 20% were females.

With regard to age, over half 52% of the respondents were aged 30-39 years, 13% were less than 30 years of age, 14% were 40-49 years of age, while 21% were 50 years of age and above (Table 2). These findings were particularly important given the fact that the two thirds of the agricultural extension staff (65%) included youth less than 39 years of age

who were physically capable and active in reaching out to more scattered smallholder farmers in rural areas. This is supported by Khan (2017) who states that younger AEOs are more energetic and able to utilize their energies for supervising and administering the agricultural activities. The presence of young generation of agricultural extension officers present an opportunity for the government to revitalize the extension programme (Simelane, 2019).

Study findings presented in Table 2 also show that the respondents' work stations varied as 78% of them worked as Ward Agricultural Extension Officers (WAEOs) and 22% as Village Agricultural Extension Officers (VAEOs). For example, data of AEOs from five districts of Simiyu region in May 2019 showed that, there were 183 AEOs. Of these, 18 (9.8%) worked at the district headquarters, 132 (72.1%) worked at the ward level, while 33(18%) worked at village level (Agricultural Regional Secretariat Report, 2019). This implied that over two third (72.1%) of the AEOs were located at ward levels.

Table 2: Respondents' sex, age and their work stations (n=100)

	Frequency	%
Sex		
Male	88	88.0
Female	12	12.0
Total	100	100.0
Age		
Less than 30	13	13.0
30-39	52	52.0
40-49	14	14.0
50 and above	21	21.0
Total	100	100.0
Work station		
Ward Agricultural Extension Officers	78	78.0
Village Agricultural Officers	22	22.0
Total	100	100.0

4.1.2 Respondents' education qualification and area of specialization

With regard to education qualification, most of the respondents, 77% had diploma, 14% had certificates, eight had first degrees, while 1% had a master degree (Table 3). These study findings conforms with those of Mauki and Ngowi (2018); Mbega (2015) and Chiligati (2010) who reported that most of the AEOs stationed at the Ward and Village levels had diploma qualifications.

Table 3 also show that over two thirds, 71% of the AEOs had specialized in general agriculture, 12% in crop production, 7% in agricultural extension and 3% in livestock production. Other specializations included irrigation, agro-mechanization, agribusiness, and agricultural education was only mentioned by 7% of the respondents. The study results are in line with those of Mauki and Ngowi (2018) who reported that the highest proportion of agricultural extension staff had specialization in general agriculture 42%.

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Table 3: Respondents' education levels and their area of specialization (n=100)

	Frequency	%
Education level		
Certificate	14	14.0
Diploma	77	77.0
Degree	8	8.0
Masters	1	1.0
Total	100	100.0
Area of specialization		
Crop Production	12	12.0
Livestock Production	3	3.0
Agricultural Extension	7	7.0
General Agriculture	71	71.0
Irrigation, agro-mechanization, agribusiness and agricultural education	7	7.0

4.1.3 Respondents' work experience and salaries

Table 4 indicates that of all the respondents, 38% of them had work experience from 6-15 years, followed by 33% who had up to 5 years, while 21% had work experience from 26-35 years. Few, 8% of the respondents had work experience from 16-25 years. These study results show that, the highest proportion of AEOs in the study areas had less experience in terms of number of working years. The results are in agreement with those of Mbega (2015) who found that more than half (53%) of the AEOs had work experience of less than 5 years. This implies that AEOs respondents may have not yet developed competence in performing their mandated roles.

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Table 4: Work experience of respondents in the study area (n=100)

	Frequency	%
Working experience		
Up to 5 years	33	33.0
6-15	38	38.0
16-25	8	8.0
26-35	21	21.0
Total	100	100.0

4.2 Agricultural Extension Officers perceived level of awareness on their roles as per their job descriptions

It is a great challenge to feed nine billion people in the world, and this challenge requires changes in agricultural production in terms of high yields, adaptation of cropping systems to climate change, genetic improvement of plant varieties, pest management and the implementation of new farming practices (Stefanis, 2014). In bringing changes in agriculture the awareness of the AEOs on their roles is essential as they are the main professionals who work closely with farmers. The AEOs are mandated to perform the role of facilitation, organizational, intermediation, educational, technical and advisory as per their job descriptions. Shah *et al.* (2013) reported that for the farmer to change in agricultural production they require AEOs who are aware of their roles and can perform them effectively. AEOs also are mandated to perform the roles of facilitation, organizational, intermediation, educational, technical and advisory.

Objective one of this study aimed to assess the AEOs level of awareness on their roles as indicated in their job descriptions. To gather information on their awareness, a five point Likert scale was used, which was as follows: strongly agree (SA); agree (A); undecided (U); disagree (D); and strongly disagree (SD). For the case of reporting the results, strongly agree (SA) and agree (A) were grouped together as agree (A) and undecided remained as (U), while disagree (D) and strongly disagree (SD) were grouped as disagree

(D). Table 5 summarizes the findings regarding to facilitation, organization, intermediation and educational roles awareness of AEOs.

Table 5: Distribution of the respondents according to facilitation, organizational, intermediation and educational roles awareness (n=100)

Role category	% level of awareness		
	A	U	DA
Facilitation			
Facilitate group formation	91	3	6
Facilitating farmers access to credit	61	15	24
Facilitating farmers access to input suppliers	86	8	6
Facilitating farmers access to markets	80	12	8
Average perceived level of facilitation role awareness	80	9	11
Organizational			
Planning on proper land use (e.g. land for livestock, crop production, etc)	74	14	12
Developing of extension programme (e.g. develop a work plan, budget etc)	88	8	4
Participating in evaluating crop production estimates for setting up future production plans	90	10	5
Organizing farmers' meetings for identifying problems and setting priorities	93	5	2
Average perceived level of organizational role awareness	86	9	5
Intermediation			
Linking farmers with research centres	79	13	8
Cooperating with researchers to conduct experiments	81	9	10
Average perceived level of intermediation role awareness	80	11	9
Educational			
Educate farmers on proper use of soil and water	90	3	7
Educate farmers on the best use of pesticides and fertilizers	100	0	0
Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting)	99	1	0
Educate farmers on proper dietary practices for improved nutrition	78	9	13
Average perceived level of educational role awareness	92	3	5

4.2.1 Facilitation roles

Auvine *et al.* (2002) reported that facilitation “is designed to help the groups perform more effectively” and that “a facilitator’s job is to focus on how well people work

together”. For an effective facilitation to smallholder farmers, AEOs must have sufficient awareness on the roles which make them serve farmers as highlighted in the job descriptions. During this study, AEOs respondents mostly reported to be aware of their roles of facilitating farmers group formation, access to credit and input suppliers as well facilitating farmers access to market for their produce (Table 5). On the average, majority, 80% of the respondents reported that they were aware of facilitation roles, Specifically, 91% of the AEOs respondents were aware of the role of facilitating smallholder farmers in group formation. On the other hand, 86%, 80% and 63% pointed out that they were aware of the role of facilitating smallholder farmers to access to input suppliers, markets and credit, respectively. These study findings are in line with those of Msuya *et al.* (2017) study in nine African countries including Tanzania who reported that 72% of the AEOs were aware of their facilitation roles, which included facilitating smallholder farmers to access to credit, farm inputs and markets.

4.2.2 Organization roles

Anaeto *et al.* (2012) stated that an AEO is a manager in planning and organizing his/ her work and that of his assistants. Therefore, they are required to have an understanding in planning and guiding smallholder farmers on the issues that will lead them to engage in productive agriculture. AEOs need to be aware of and understand the risks that farmers are likely to face so that their decisions can reduce the negative effects of the risks associated with their farming practices (Suvedi and Kaplowitz, 2016). Hence, this study assessed the level of awareness of the AEOs (Table 5). The study found that, majority, 86% of the AEOs were aware of four organizational roles. Specifically, most, 93% and 90% of the AEOs indicated that they were aware of their roles in organizing smallholder farmers’ meetings in identifying problems and setting priorities and participating in evaluating crop production estimates for setting up future production plans, respectively. Organizing and conducting farmers' meetings helps to keep farmers together, know farmers aspirations and

their problems/constraints which they encounter and finally can set priorities. Li Pun and Koala (1994) stated that priorities settings are usually done through conducting meetings and decision making is based on the opinions of participants. Furthermore, most, 88% of the AEOs respondents reported that they were aware of the role of developing extension programmes. On the other hand, most, 74% of the AEOs respondents, indicated that they were aware of the role of planning on proper land use for livestock and crop production. Planning on land use can attract rural communities to engage themselves in sustainable agriculture such as growing perennials, contour and terrace making, which can avoid interference and re-allocation of land for other uses. Kimaro and Proches (2014) study reported that there is a growing competition between land for agriculture and other growing sectors including mining, urban expansion and infrastructure.

4.2.3 Intermediation roles

For intermediation roles, Agricultural Extension Officers (AEOs) are expected to be aware of working as a bridge between smallholder farmers with other agricultural service providers for them to conduct agricultural activities easily. Hence, this study found that on average, majority 80% of the respondents were aware of the two intermediation roles (Table 5). Specifically, most, 81% and 79% indicated that they were aware of the roles of cooperating with researchers for conducting field experiments and linking smallholder farmers with research centres, respectively. The study results are in agreements with those of Msuya *et al.* (2017) who reported that majority, 89% of the AEOs were aware of their roles of linking research centers and smallholder farmers.

4.2.4 Educational roles

Adekunle (2013) stated that educational roles are important to smallholder farmers, and can be carried out by AEOs through different combinations of extension methods and approaches of teaching, such as workshops, field training, field visits and demonstrations. AEOs mandated to perform various educational roles, which assist them to improve

smallholder farmers livelihood. This study found that, on average, majority, 92% of the AEOs respondents were aware of their educational roles. And specifically, majority, 100%, 99% and 90% of the respondents indicated that they were aware of the roles of educating smallholder farmers on the best use of pesticides and fertilizers, on the best agricultural practices, and on proper use of soil and water, respectively (Table 5). Davis (2019) stated that in developing countries AEOs roles are much focused on increasing production, improving yields, training farmers, and transferring technology. Yet, Suvedi and Kaplowitz (2016) stated that today extension services aim at responding to what farmer clients ask to satisfy their educational and information needs.

Table 6: Distribution of the respondents according to technical roles awareness

(n=100)

Role category	% level of awareness		
	A	U	DA
Technical roles;			
Testing of seed moisture content	63	22	15
Testing of seed quality	77	8	15
Testing of seed germination	92	3	5
Maintain productive plants/trees	80	7	13
Manage the daily activities in agricultural experiments	83	9	8
Control plants and crops pests	93	3	4
Collect and keep records of crop production per week, month and year	80	6	14
Collect and keep rainfall data in an area	72	10	18
Identify and supervise agro-input suppliers	66	15	19
Collect and keep crop prices per week, month and year	80	6	14
Collect and keep experimental data	73	14	13
Disseminate new research findings to farmers	89	5	6
Participate in agricultural research	77	12	11
Identify and conserve water catchment areas	65	16	19
Average perceived level of technical role awareness	78	10	12

4.2.6 Technical roles

Sani *et al.* (2014) stated that farmers require scientific and technical information because it is among the most important one needed in agriculture for wealth creation and national development. From this point of view, AEOs need to be aware of the technician roles on the various extension services that they perform. Study findings in Table 6 show that majority, 78% of the AEOs were aware of their technical roles for increasing farmers productivity. Specifically, study results indicated that most, 93% and 92% were aware of their technical roles of helping smallholder farmers in controlling plants and crop pests, and testing seed germination, respectively.

Table 7: Distribution of the respondents according to advisory and administrative roles awareness (n=100)

Role category	% level of awareness		
	A	U	DA
Advisory			
Advice farmers' groups on making better decisions to increase agricultural production	97	1	2
Advice farmers on how to practice diversified agriculture	90	7	3
Average perceived level of advisory role awareness	94	4	2
Administrative			
Collect taxes in the area	26	20	54
Coordinate and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)	43	22	35
Work as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)	40	15	45
Undertake entrepreneurial activities	63	17	20
Conduct evaluation of buildings, roads and other infrastructure and tree plantations in the area	21	15	64
Average perceived level of administrative role awareness	38	18	44

4.2.5 Advisory roles

Awareness in advisory roles helps AEOs to interpret and explain the language of modern technology to smallholder farmers in order to transform the agriculture sector positively and sustainably (Suvedi and Kaplowitz, 2016). The study results show that majority, 94%

of the respondents were aware of their advisory roles. These findings concur with Msuya *et al.* (2017) study which reported that majority 92% of the AEOs were aware of their roles of advising smallholder farmers in increasing agricultural production. Specifically, most, 97% and 90% of the respondents reported that they were aware of their roles of advising smallholder farmers' groups on making better decisions for increasing agricultural production and advising them on how to practice diversified agriculture, respectively.

4.2.7 Administrative roles

In this context, an administrative role implies those that are not in the AEOs job description. Study findings in Table 7 indicated that on average less than half, 38% of the respondents were aware of the administrative roles which were outside their assigned roles in the job description. The study went further to assess the level of awareness of the AEOs on the "outside" administrative roles, and it was found that more than half, 63% were aware of the role in undertaking entrepreneurial activities. Undertaking of entrepreneurial activities was a manifestation of low support in terms of infrastructure for the AEOs such as transportation, allowances, lack offices and teaching aids as sometimes they perform this role themselves during the working hours. Furthermore, of all the respondents, 40% of them reported that they were aware of the role of working as ward or village executive officers.

Summary of role categories of AEOs on their perceived level of awareness

Table 8: Distribution of AEOs according to perceived level of roles awareness

Role category	% average level of role awareness		
	Agree	Undecided	Disagree
Facilitation	80	9	11
Organizational	86	9	5
Intermediation	80	11	9
Educational	92	3	5
Technical	78	10	12
Advisory	94	4	2
Administrative	38	18	44

Table 8, shows that more than 70% of the respondents indicated their perceived level of awareness on advisory, educational and organizational roles. Others included facilitation, intermediation and technical roles. With this findings on role awareness can be stated that AEOs job descriptions were well known and the mandated roles to them as stipulated in the Scheme of Service for Local Government Authorities (Compiled version from 2002-2011).

4.3 Agricultural Extension Officer's Perceived Level of Role Performance

Farmers require an array of technical services and inputs, for example, knowledge, skills, improved seeds, chemicals, markets, credit, storage and processing facilities in order to carry out farm operations (Mattee, 1994). The AEOs are mandated with variety of roles to perform to smallholder farmers for improving rural livelihood. They are expected to play a key role in linking smallholder farmers to agricultural scientists, researchers, assist farmers in the adoption of improved agricultural technologies and facilitate the adjustment of the new technologies to the local agro-ecological conditions (Haile and Abebaw, 2012). In this study, AEOs were requested to indicate different roles they performed in their day to day endeavor. These included facilitation, organizational, intermediation, educational, technical, advisory and administrative. In a five point Likert scale the respondents were also requested to indicate their perceived level of role performance and these were presented as very frequent (VF), frequent (F), moderate (M), rarely (R), very rarely (VR). For the purpose of this discussion, VF and F were grouped as Frequent (F) and moderate remained as M, while VR and R were grouped as Rare (R). Table 8 summarizes the findings regarding to facilitation, organization, intermediation and educational roles performed by AEOs.

Table 9: Distribution of the respondents according to facilitation, organizational, intermediation and educational roles performed (n=100)

Role category	% level of performance		
	F	M	R
Facilitation			
Facilitate group formation	68	20	12
Facilitating farmers access to credit	27	26	47
Facilitating farmers access to input suppliers	63	18	19
Facilitating farmers access to market	54	25	21
Average perceived level of facilitation role performance	53	22	25
Organizational			
Planning on proper land use	29	33	38
Developing of extension programmes	61	27	12
Participating in evaluating crop production estimates for setting up future production plans	63	22	15
Organizing farmers' meetings for identifying problems and setting priorities	68	18	6
Average perceived level of organizational role performance	55	25	18
Intermediation			
Linking farmers with research centres	18	24	58
Cooperating with researchers to conduct experiments	28	26	46
Average perceived level of intermediation role performance	23	25	52
Educational			
Educate farmers on proper use of soil and water	79	10	11
Educate farmers on the good use of pesticides and fertilizers	95	4	1
Educate farmers on the good agricultural practices (e.g. land preparation, spacing, weeding and harvesting)	96	3	1
Educate farmers on proper dietary practices for improved nutrition	28	24	20
Average perceived level of educational role performance	76	10	8

4.3.1 Facilitation roles

Facilitation is a participatory approach of “teachings people how to catch fish” (Suvedi and Kaplowitz, 2016). This implies that AEOs as facilitators are expected to help smallholder farmers to build a sustaining capacity. However, most of our smallholder farmers do not have enough networks for accessing information about most of the things such as inputs, credits, markets that would be required to sustain their agricultural production. Hence, AEOs are required to play a facilitation role in helping smallholder

farmers access to these services for them to sustain and improve production. The study findings in Table 9 show that about half of the interviewed AEOs (53%) reported that they frequently perform facilitation role. Specifically, they facilitate group formation, access to input suppliers, markets and access to credit. The study went further to investigate their perceived levels of facilitation in these specific roles. According to the findings in Table 8, over two thirds, 68% of the respondents reported that they performed the role of facilitating smallholder farmers in group formation. This finding is in line with Fischer and Qaim (2012) who found that farmers often fail to organize themselves into formal groups, hence they need facilitation support from AEOs.

Credit is one of the obstacles to most smallholder farmers not to get enough money for buying the necessary agricultural inputs such as improved seeds, fertilizers, pesticides and herbicides for improving their agricultural production (Ragasa *et al.*, 2013). Usually farm credits determine farmers' effective performance in most farm activities. . In this study, 63% of AEOs indicated that they frequently facilitate farmers' access to input suppliers but it is interestingly to note that almost half of the interviewed AEOs (47%) they rarely facilitate farmers' access to credit from financial institutions, which is one of the necessities for enabling farmers to access inputs. According to Suvedi and Kaplowitz (2016), many smallholder farmers produce food for their families, but currently, as the world around them changes and inputs are increasingly procured from the markets, they are required to have money, and many farmers need effective facilitation on how and where they can assess credits.

Market is one of the production factors since its availability encourages farmers to produce more for selling as a source of their income and livelihood in general. During the survey

AEOs were asked on whether they facilitate farmers' access to market and the results are summarized in Table 9. About 54% of the respondents indicated that they play role of facilitating farmers to access market for their produce. Extension services enables producers to realize increased production and productivity through accessibility to information for marketing and other support services essential for agricultural development (URT, 2013). This implies that AEOs to play the role of facilitating farmers access to market is of great important in improving rural livelihood.

4.3.2 Organizational roles

Davis *et al.* (2019) assert that organizational capacity is a critical element in extension which AEOs require to have for well-functioning of the extension systems. In this study 55% of the interviewed AEOs indicated that they frequently perform organizational roles in the area under their jurisdiction. Specifically, they indicated that they performed the role of organizing farmers' meetings for identifying problems and setting priorities, participating in evaluating crop production estimates for setting up future production plans and development of extension programmes, and planning on proper land use. Table 9 indicates AEOs levels of performance of the above roles. One third (68%) of the respondents reported that they organized farmers' meetings for identifying their problems and setting priorities. Usually, AEOs in collaboration with Ward Extension Officers (WAEOs) /Village Extension Officers (VAEOs) organize farmers' meetings, which help to bring together large number of farm families at once for disseminating agricultural information.

It sometimes happens that an AEO may re-plan a farm in agreement with farmers, and sometimes it may be necessary for him/her to develop recovery programmes for eroded soils, protect cultivated land against erosion and develop a new pasture system (Stock,

2015). Regarding planning on proper land use, only 29% of the respondents mentioned that they frequently played that role. Others indicated that they rarely or moderately performed that role despite the importance of proper land planning.

4.3.3 Intermediation roles

Intermediary means involvement of two or more parts in order to achieve an intended goal in both parties, for example, in agricultural extension activities, AEOs can play the role of an intermediary role between smallholder farmers and researchers. It has been suggested that the existence of an intermediary promotes the building of trust relationships (Coleman, 1990). The study findings indicate that the intermediation role performed by AEOs include linking smallholder farmers with research centres and co-operating with researchers to conduct experiments. The study also examined the level of performance of these specific intermediation roles and it was found that only 18% and 28% of the respondents frequently performed role of linking smallholder farmers with researchers and conducting agricultural experiments, respectively. Generally, the study findings show that over half of the AEOs (52%) rarely performed this role despite of its importance. This implies that the AEOs were adequately not performing the intermediation roles in the study areas. These results are in line with those of Chiligati (2010) study conducted in western research zone, Tanzania who reported that over half of the AEOs (57%) indicated low linkages researchers and AEOs. Other studies, Oladele (1999); Baig and Aldosari (2013); Boyaci and Yildiz (2016) found that there were weak linkages between farmers, AEOs, and researchers, which contributed to poor dissemination of agricultural research information.

4.3.4 Educational roles

One of the many instruments that can be used by extension to enhance the adoption of sustainable practices by smallholder farmers is education (Abdu-Raheem, 2013). AEOs in playing educational roles, they serve as expert sources of information (teacher) ([Raison](#),

[2010](#)). [During](#) the interview, respondents indicated that they performed the following educational roles: educating smallholder farmers on good agricultural practices such as land preparation, spacing, weeding and harvesting. Other educational roles performed were educating on the good use of pesticides, fertilizers, on proper use of soil and water as well as proper dietary practices for improved nutrition (Table 9). The study also assessed the level of AEOs performance on these educational roles. On average the majority of AEOs (76%) indicated that they frequently performed educational roles. Specifically, the role of educating smallholder farmers on the good agricultural practices; use of pesticides and fertilizers as well as educating farmers on proper use of soil and water were frequently performed by the majority of respondents, 96%, 95% and 79%, respectively. The study findings by Baloch and Thapa (2016) in Pakistan, also found that AEOs advised smallholder farmers in applying pesticides and fertilizers, land preparation and how to manage water in their irrigated fields.

Furthermore, the study results found that the role of educating farmers on proper dietary practices for improved nutrition was only indicated by 28% of the AEOs respondents, although this is an important aspect for the betterment of smallholder farm families. According to Food and Agriculture Organization FAO (2017), AEOs are probably the best resource to help in achieving nutrition security through educating smallholder farmers due to their established networks and a greater reach to rural communities.

Table 10: Distribution of the respondents according to technical roles performed**(n=100)**

Role category	% level of performance		
	F	M	R
Technical			
Testing of seed moisture content	29	14	57
Testing of seed quality	53	17	30
Testing of seed germination	80	9	11
Maintain productive plants/trees	51	30	19
Manage the daily activities in agricultural experiments	66	13	21
Control plants and crops pests	95	3	2
Collect and keep records of crop production per week, month and year	79	11	10
Collect and keep rainfall data in an area	37	19	44
Identify and supervise agro-input suppliers	54	14	32
Collect and keep crop prices per week, month and year	62	17	21
Collect and keep experimental data	45	27	38
Disseminate new research findings to farmers	51	24	25
Participate in agricultural research	21	26	53
Identify and conserve water catchment areas	41	27	32
Average perceived level of technical role performance	54	18	28

4.3.5 Technical roles

The study went further to investigate other roles performed by AEOs in the study area and these included technical roles. Technical skills are abilities an individual acquires through practice and learning (Barone, 2019). The AEOs are expert in various technical skills in agricultural activities, hence they are required to play the technician roles to farmers. AEOs assist farmers to improve their livelihood by providing them with technical information and advice which are crucial in farming decision-making (Pangani, 2007). These technical advices are often linked to inputs such as seed, fertilizer, pesticides, and demonstration of new technology and control plants and crop (Suvedi and Kaplowitz, 2016). In this study the investigated technical roles include testing of seed moisture content, seed quality, seed germination, just to mention few.

The results in Table 10 show that AEOs performed various roles including controlling plants and crops pests, testing of seed germination, identify and conserve water catchment areas, testing of seed quality and collect and keep rainfall data. The study further assessed the perceived level of role performance by AEOs. Of all AEOs respondents, majority (95% and 80%) reported that they had performed the role of controlling plants and crops pests and testing of seed germination, respectively. Seed germination test perceived to be performed by the majority of AEOs, as it is the first thing required before starting of cotton seed distribution to farmers. In which cotton Seed companies (ginners) have to delivery their seeds for testing its germination in different production areas. Also the study was conducted in areas where most of smallholder farmers involved in cotton production. Chami (2018) stated that “Simiyu region is widely recognized as the leading cotton producer in Tanzania”. Mubofu and Elia (2015) study in three district, Tanzania found that most of the smallholder farmers received information from AEOs on improved seedlings, use of fertilizers, and on crop and pest management. The role of testing of seed moisture content and participate in agricultural researches perceived to be rarely performed in the study area, reported by 29%, 21% of the AEOs respondents. Chiligati (2010) stated that lack of collaboration between AEOs, researchers and other agricultural development partners leads to AEOs not to have consistence technical messages to smallholder farmers.

Table 11: Distribution of the respondents according to advisory and administrative roles performed (n=100)

Role category	%level of performance		
	F	M	R
Advisory			
Advice farmers' groups on making better decisions to increase agricultural production	95	4	1
Advice farmers on how to practice diversified agriculture	61	24	15
Average perceived level of advisory role performance	78	14	8
Administrative			
Collect taxes in the area	21	17	62
Coordinate and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)	34	16	50
Work as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)	49	20	31
Undertake entrepreneurial activities	49	19	32
Conduct evaluation of buildings, roads and other infrastructure and tree plantations in the area	15	22	63

4.3.6 Advisory roles

Advisory means supporting farmers to solve their own problems now and in the future (Christoplos and Kidd, 2000). The AEOs give advice to smallholder farmers on different agricultural aspects for them to decide on implementation strategies. Suvedi and Kaplowitz (2016) assert that advisory services aim at developing self-sufficiency in agricultural extension, which can lead to increases in productivity and efficiency to smallholder farmers. The conventional agricultural extension services in Tanzania is mainly provided by AEOs through visiting farmers (Sanga *et al.*, 2013). In this study, AEOs respondents reported that they performed the advisory roles such as advising farmers' groups on making better decisions to increase agricultural production and help them on how to practice diversified agriculture. The study went further in assessing AEOs perceived level of performance for advising farmers' groups on making better decisions for increased agricultural production, and was mentioned by the majority, 95% of the respondents. For example, Baig and Aldosari (2013) study in Asia found that extension

absolutely remains a service helping farmers to help themselves and helping farm groups to organize themselves. Another role was advising farmers on how practice diversified agriculture, which its perceived level of performance reported by 61% of the respondents.

4.3.7 Administrative roles

In extension services, administrative roles mean activities which are performed outside the routine given job description. During the study, respondents indicated that they performed the administrative roles, which were outside their given job descriptions, such as working as leaders (WEOs, VEOs), collecting taxes, undertaking entrepreneurial activities, coordinating and supervising different non-agricultural programmes, conduct evaluation of buildings, roads, other infrastructure and tree plantations (Table 11). The study also assessed the level of role performance which showed that 49% and 34% of the AEOs respondents, indicated that they performed their non traditional roles, for example, as ward or village executive officers and coordinated and supervised different programmes. Performing these roles could be a source of weak relationships between AEOs and farmers. For example, AEOs were asked to collect taxes or supervise tax collection, which often was a role done by village and ward executive officers and designated district tax collectors. Observation showed that sometimes farmers decided not to cooperate with AEOs who performed their non designated roles. These study findings are in line with those of Mbega (2015) study in Handeni, Tanzania who reported that AEOs were also given administrative roles, which made them not to regularly visit farmers for which they could establish demonstration plots for teaching farmers. Also, Elifadhili (2013) study in three districts in Tanzania found that AEOs were sometimes assigned by village executive officers to perform administrative duties in the village government, these kinds of additional responsibilities conflicted with their job descriptions and consume time which would have been spent with farmers

Summary of role categories of AEOs on their perceived level of performance.

Table 12: Distribution of the respondents according to the perceived level of roles performed (n=100)

Role category	Average % of perceived level of role performed		
	Frequent (F)	Moderate (M)	Rarely (R)
Facilitation	53	22	25
Organizational	55	25	18
Intermediation	23	25	52
Educational	76	10	8
Technical	54	18	28
Advisory	78	14	8
Administrative	33	19	48

Study result in Table 12 shows that most, 78% of the respondents reported that they performed the advisory roles as compared to the other role categories. Other role categories performed were mentioned by about half of the respondents, while intermediation role performance was only mentioned by 23% of the respondents. The low mention of this role may be attributed to the Local Government Authority (LGA) not giving priority in allocating funds to the Department of Agriculture for facilitating AEOs role performance in their work stations. As a result, AEOs were required to use their own money to accomplish various tasks, which in most cases were not well performed. The study findings also showed that less than half, 33% of the respondents reported to performing the administrative roles. This implied that there was an improvement in reducing the non-extension roles to AEOs, which were an additional workload to them. As reported by Elifadhili (2013) additional responsibilities (administrative roles) to AEOs increased their workload, conflicted with their job description, which consumed their time which would have been spent with smallholder farmers.

4.4 Agricultural Extension Officers Level of Competence on Their Roles

Competence has several definitions based on the context in which it is being used. In this study we adapt Issahaku's (2014) definition that "competence is the ability to perform a specific task in a manner that yields desirable outcomes". According to Okwoche *et al.* (2011) farmers success depend primarily on the AEOs level of competence to ensure a steady flow of appropriate information. On the other hand, it was reported that all types of farmers, especially smallholder farmers depend on trustworthy and competent extension advisory services as a source of knowledge and information (Stevens and van Heerden, 2016). Therefore, AEOs are required to be competent on the mandated roles such as facilitation, organizational, intermediation, educational, technical and advisory. Furthermore, this study aimed at assessing the AEOs perceived level of competence on their roles. To gather information on their perceived level of competence, a five point Likert scale was used, which was as follows: strongly agree (SA); agree (A); undecided (U); disagree (D); and strongly disagree (SD). For the purpose of reporting the results, strongly agree (SA) and agree (A) were grouped together as agree (A) and undecided remained as (U), while disagree (D) and strongly disagree (SD) were grouped as disagree (D). Table 10 summarizes the findings regarding the perceived AEOs level of competence of the above mentioned roles.

Table 13: Distribution of the respondents according to facilitation, organization, intermediation and educational roles competence (n=100)

Role category	% level of competence		
	HC	AC	LC
Facilitation			
Facilitate group formation	58	32	10
Facilitating farmers access to credit	31	39	30
Facilitating farmers access to input supply	59	28	13
Facilitating farmers access to market	48	41	11
Average perceived level of facilitation role competence	49	35	16
Organization			
Planning on proper land use e.g. land for livestock, crop production	43	43	14
Planning of extension programme e.g. develop a work plan, budget	70	23	7
Participating in evaluating crop production estimates for setting up future production plans	68	22	10
Organizing farmers' meetings for identifying problems and setting priorities	70	23	7
Average perceived level of organizational role competence	63	28	9
Intermediation			
Linking farmers with research centres	35	33	32
Cooperating with researchers to conduct experiments	47	38	15
Average perceived level of intermediation role competence	40	35	25
Educational			
Educate farmers on proper use of soil and water	70	23	7
Educate farmers on the best use of pesticides and fertilizers	85	11	4
Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc)	88	8	4
Educate farmers on proper dietary practices for improved nutrition	30	43	27
Average perceived level of educational role competence	68	21	11

4.4.1 Facilitation roles

According to Ngwenya and Hagman (2007), “facilitation competence does not go without self-development of a person, an insecure or not very confident person does not make a good facilitator”. Facilitation includes process related skills that comprise elements like process observation (e.g. monitoring and evaluation) and process documentation. Facilitation techniques include questioning and probing, giving and receiving feedback,

and managing group dynamics. Table 13 shows that on average, less than half, 49% of the respondents indicated that they were aware about their perceived level competence in performing facilitation roles. Observation show that the low perceived level of competence in performing facilitation roles was perhaps due to the AEOs few years of their work experience as more than half had worked for less than five years, and not being involved in the in-service training.

Nwaogu and Akinbile (2018) study in Oyo and Ogun- Nigeria found that the AEOs competence level was associated with age and years of work experience. For the specific facilitation roles, the findings show that, more than half, 59% and 58% of the respondents reported that they were aware about their perceived level of competence in performing the role of facilitating smallholder farmers access to input suppliers and on group formation, respectively. In addition, less than half, 48% and 31% of the AEOs respondents, indicated that they were aware about their perceived level of competence in performing the role of facilitating smallholder farmers to access markets and credit from financial institutions, respectively.

4.4.2 Organization roles

In this context, organization roles means being able to plan on issues related to extension, especially provision of extension services to smallholder farmers. The study the findings show that, on average, 63% of the respondents that they were aware about their perceived level of competence in performing in performing the four organization roles (Table 13). Specifically, of all the respondents, 70% of them reported that they were aware about their perceived level of competence in planning of extension programme and organizing smallholder farmers' meetings for identifying problems and setting priorities, respectively. Nwaogu and Akinbile (2018) reported that AEOs level of competence was high in

planning of extension programme. But, Al-Zahrani *et al.* (2017) study in Saudi Arabia, reported that AEOs showed lower competences in organizing extension program planning.

4.4.3 Intermediation roles

AEOs have common roles as laid down in their job descriptions which include intermediation roles. They are expected to have competence in “linking farmers/ producers with research-based information, cooperate with researchers to improve agricultural production, productivity, processing and marketing of agricultural goods and services” (Suvedi and Kaplowitz, 2016). The study findings show that, less than half 40% of the respondents reported that they were aware about their perceived level of competence in performing the two intermediation roles. Specifically, less than half, 47% and 35% of the AEOs respondents pointed out that they were aware about their perceived level of competence in performing the role of cooperating with researchers in conducting field experiments and linking smallholder farmers with research centres, respectively.

4.4.4 Educational roles

AEOs competence in educational roles increase their confidence and improves the quality of delivering extension services to smallholder farmers. Study results presented in Table 13 show that, on average over two thirds, 68% of the respondents indicated that they were aware about their perceived level of competence in performing the four educational roles. Of all the respondents, most 88% and 85% mentioned that they were aware about their perceived level of competence in performing the role of educating smallholder farmers on the best agricultural practices and use of pesticides and fertilizers, respectively.

Table 14: Distribution of the respondents according to technical roles competence**(n=100)**

Role category	% level of competence		
	HC	AC	LC
Technical			
Testing of seed moisture content	35	2	36
Testing of seed quality	59	19	22
Testing of seed germination	77	14	9
Maintain productive plants/trees	52	34	14
Manage the daily activities in agricultural experiments	55	31	14
Control plants and crops pests	77	16	7
Collect and keep records of crop production per week, month and year	69	21	10
Collect and keep rainfall data in an area	39	30	31
Identify and supervise agro-input suppliers	46	29	25
Collect and keep crop prices per week, month and year	68	19	13
Collect and keep experimental data	46	32	22
Disseminate new research findings to farmers	52	34	14
Participate in agricultural research	30	48	22
Identify and conserve water catchment areas	29	45	26
Average perceived level of technical role competence	52	29	19

4.4.5 Technical roles

According to Mbega (2015) AEOs must be competent in the technical areas of their job in terms of knowledge and skills. The study findings show that on average, half, 52% of the respondents reported that they were aware about their perceived level of competence in performing technical roles. Specifically, most, 77% of the respondents indicated that they were aware about their perceived level of competence in performing the technical role of testing seed germination, and helping smallholder farmers control plants and crops pests, respectively (Table 14). It was surprising that only 29% of the AEOs respondents indicated that they were competent in identifying and conserving water catchment areas, when observation revealed that this aspect was a serious problem in the study area. Furthermore, in the study areas, water is a prerequisite for conducting viable agricultural activities; identification and management of water resources involving communities is expected to be

given a high priority level of competence by all AEOs so as to create a sustainable agricultural productivity. Suvedi and Kaplowitz (2016) reported that AEOs should be current with emerging technologies, be able to handle challenges, tap opportunities and demonstrate competence in technical advice to smallholder farmers.

Table 15: Distribution of the respondents according to advisory and administrative roles competence (n=100)

Role category	% level of competence		
	HC	AC	LC
Advisory			
Advice farmers' groups on making better decisions to increase agricultural production	84	13	3
Advice farmers on how to practice diversified agriculture	65	26	9
Average perceived level of advisory role competence	75	19	6
Administrative	75	19	6
Collect taxes in the area	8	33	59
Coordinate and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)	25	26	49
Work as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)	27	31	42
Undertake entrepreneurial activities	36	40	24
Conduct evaluation of buildings, roads and other infrastructure and tree plantations in the area	11	23	66
Average perceived level of administrative role competence	21	31	48

4.4.6 Advisory roles

Advisory means being in a capacity to provide opinions to a person. AEOs are crucial stakeholders in identifying smallholders' needs, problems, wishes and supply technical inputs to them (Belay and Abebaw, 2004). This study found that, on average majority, 75% of the of the respondents mentioned that they were aware about their perceived level of competence in performing advisory roles. For the individual role, it was found that, most, 84% of the respondents reported that they were aware about their perceived level of competence in performing the role of advising smallholder farmers' groups in making

better decisions to increase agricultural production. While, 65% of the AEOs respondents indicated that that they were aware about their perceived level of competence in advising smallholder farmers on how to practice diversified agriculture (Table 15).

4.4.7 Administrative roles

In this study, administrative roles were termed as roles that were not in AEOs job descriptions. The study findings show that, on average, less than half, 21% of the respondents reported that they were aware about their perceived level of competence in administrative roles. Specifically, 36% and 27% of the respondents mentioned that they were aware about their perceived level of competence in administrative roles that involved undertaking entrepreneurial activities and working as ward or village executive officers, respectively (Table 15).

The study findings show that 75%, 68% and 63% of the respondents reported their perceived level of competence in advisory, educational and organizational roles, respectively. Less than half, 49% and 40% of the respondents indicated their perceived level of competence in facilitation and intermediation roles. Low perceived level of competence may be due to the curriculum used to teach AEOs in the institutions that probably did not include some of the roles as mentioned in their job description after being employed. Also, this could be attributed by the lack of in-service training for capacity building as observed in the field as good agricultural practices also changing. As stated by Suvedi and Kaplowitz (2016), the roles of AEOs in agricultural development is continuously evolving, and effective front-line staff members need skill sets that may differ from those they learned in college.

Summary of role categories of AEOs and their perceived level of competence

Table 16: Distribution of AEOs according to facilitation, organization, and intermediation, educational, technical, advisory and administrative roles perceived level of competence

Role category	Average % of perceived level of competence		
	High Competence	Moderate competence	Not competence
Facilitation	49	35	16
Organizational	63	28	9
Intermediation	40	35	25
Educational	68	21	11
Technical	52	29	19
advisory	75	19	6
Administrative	21	31	48

The study findings show that most (75%) of the AEOs were competent in performing advisory roles. However, the least competent roles that AEOs performed were educational, organizational, technical, facilitation, intermediation and administrative. Majority of AEOs were not competent in performing various roles, for example facilitation and intermediation roles reported with less than half (49%), (40%) respectively, this may be associated by lack of training to AEOs aims at capacity building.

4.5 Agricultural Extension Officer's Opinions in Relation to Their Roles

“Opinion” can be defined as a view or judgment formed about something, not necessarily based on facts or knowledge. It can also be defined as the ideas that a person or a group of people have about something or someone, which are based mainly on their feelings and beliefs (*Cambridge Advanced Learner's Dictionary & Thesaurus, year*). In reality every individual do have different perspective on their work by comparing on what was expected with real situation in work. Therefore, to know the opinion of individuals about their work

is crucial, as it helps to understand how much work is being done and what are things need to be changed for improvement.

4.5.1 Agricultural extension officer's perceived level of importance on their roles.

AEOs are key players in helping smallholder farmers to acquire important knowledge and skills, hence, to a large extent their performance depends on how they perceive their roles. In this study, AEOs respondents were requested to indicate their perceived level of importance of the roles that they performed, which included facilitation, organization, intermediation, educational, technical, advisory and administrative. In order to elicit the required information, a five point Likert scale was used to indicate the perceived importance of each role as follows: Most important (MI), Important (I), moderate (M), Less important (LI) and Not important (NI). In reporting the results, MI and I were grouped together as Important (I) and moderate remained as M, while LI and NI were grouped together as Not important (NI). Table 17 summarizes the study findings regarding to the perceived level of importance of extension officers roles namely, facilitation, organization, intermediation and education.

Table 17: Distribution of the respondents according to facilitation, organizational, intermediation and educational roles on perceived level of important (n=100)

Role category	% level of importance		
	I	M	NI
Facilitation			
Facilitate group formation	93	7	0
Facilitating farmers access to credit	76	13	11
Facilitating farmers access to input suppliers	92	5	3
Facilitating farmers access to market	90	8	2
Facilitation roles the average perceived level of importance	88	8	4
Organization			
Planning on proper land use (e.g. land for livestock, crop production, etc)	91	9	0
Planning of extension programme (e.g. develop a work plan, budget etc)	89	7	4
Participating in evaluating crop production estimates for setting up future production plans	96	3	1
Organizing farmers' meetings for identifying problems and setting priorities	94	4	2
Organizational roles the average perceived level of importance	93	6	1
Intermediation			
Linking farmers with research centres	76	14	10
Cooperating with researchers to conduct experiments	81	15	4
Intermediation roles average perceived level of importance	78	15	7
Educational			
Educate farmers on proper use of soil and water	96	3	1
Educate farmers on the best use of pesticides and fertilizers	82	15	3
Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc)	97	1	2
Educate farmers on proper dietary practices for improved nutrition	85	12	3
Educational roles the average perceived level of importance	90	8	2

4.5.1.1 Facilitation roles

Facilitation roles aim at making sure that the discussion in a given topic are conducted smoothly and covers the main goal. A good facilitator must ensure that everyone listens, stays on the topic which is being discussed, knows their roles and feels included in the process. The facilitation roles investigated include facilitating group formation, access to credit, market and access to input suppliers. The study findings presented in Table 17 show that on average, 88% of the respondents perceived four facilitation roles as being important. Specifically, 93% of the AEOs respondents perceived the role of facilitating smallholder farmers' group formation as important. This is in line with URT (2015), which contends that group formation and adoption of collective approach are indispensable steps for realizing agricultural commercialization. Similarly, 92% and 90% of the respondents perceived the role of facilitating smallholder farmers access to input suppliers and to markets, respectively as important. The findings are in line with those of Kumar *et al.* (2013) who found that AEOs rated the roles of facilitating farmers access to input suppliers, credit and markets as important.

4.5.1.2 Organizational roles

Table 17 shows that, on average, 91% of the interviewed respondents indicated that organizational roles were also perceived as important. Similarly, Al-Zahrani *et al.* (2017) study results showed that the AEOs wanted to increase their competences on how to organize and implement extension programmes as important roles in the extension services. . Regarding each organizational role investigated, 96%, 94% and 91% of the interviewed AEOs perceived that evaluating crop production estimates for setting up future production plans, organizing smallholder farmers' meetings for identifying

problems and setting priorities, and planning on proper land use, respectively as important roles in extension service delivery.

The other role that was perceived as important by most of AEOs (89%) was development of extension programme. Similar findings were reported by Kumar *et al.* (2013) who reported that the AEOs regarded organizational roles as important in planning extension programmes and in the delivery of extension services in general.

4.5.1.3 Intermediation roles

Takemura *et al.* (2014) reported that roles of individuals playing as an intermediary in social relationships, has been suggested to create and maintain social capital in which trust relationships may be promoted in delivering extension services. The intermediation roles investigated in this study were linking farmers with research centres and cooperating with researchers to conduct experiments. The study findings show that 78% of the interviewed AEOs perceived the intermediation roles as important. More specifically, 81% and 76% of the AEOs respondents that they were aware about their perceived level of importance on the role of cooperating with researchers to conduct field agricultural experiments and linking smallholder farmers with research centres respectively as important in extension service delivery.

4.5.1.4 Educational roles

The study findings show that, on average, 90% of the interviewed respondents perceived educational roles as important to smallholder farmers. Nwaogu and Akinbile (2018) also found that AEOs perceived the extension education and teaching roles as important. The study went further to investigate the level of importance of specific educational roles performed. It was found that, most, 97% and 96% of the AEOs respondents were aware about their perceived level of importance of the roles of educating smallholder farmers on

the best agricultural practices and on proper use of soil and water, respectively as important in extension service delivery (Table 17).

Table 18: Distribution of the AEOs according to their perception towards the importance of technical roles (n=100)

Role category	% level of importance		
	I	M	NI
Technical			
Testing of seed moisture content	81	9	10
Testing of seed quality	89	3	8
Testing of seed germination	95	2	3
Maintain productive plants/trees	87	10	3
Manage the daily activities in agricultural experiments	81	13	6
Control plants and crops pests	94	3	3
Collect and keep records of crop production per week, month and year	87	10	3
Collect and keep rainfall data in an area	75	12	13
Identify and supervise agro-input suppliers	78	10	12
Collect and keep crop prices per week, month and year	81	11	8
Collect and keep experimental data	77	20	3
Disseminate new research findings to farmers	88	5	7
Participate in agricultural research	85	10	5
Identify and conserve water catchment areas	72	20	8
Technical roles the average perceived level importance	83	10	7

4.5.1.5 Technical roles

Results in Table 18 show that, on average, most, 83% of the interviewed AEOs perceived the technical roles as important. These findings are in agreement with those of Nwaogu and Akinbile (2018) who reported that AEOs perceived the technical roles as important. Specifically, most, 95% and 94% of the respondents indicated that they were aware about their perceived level of importance of the roles concerning testing of seed germination, and control of plants and crops pests, respectively.

Table 19: Distribution of the respondents according to their perception towards the importance of advisory and administrative roles (n=100)

Role category	% level of importance		
	I	M	NI
Advisory			
Advice farmers' groups on making better decisions to increase agricultural production	98	2	0
Advice farmers on how to practice diversified agriculture	91	6	3
Advisory roles the average perceived level of importance	95	4	1
Administrative			
Collect taxes in the area	35	24	41
Coordinate and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)	44	21	35
Work as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)	40	20	40
Undertake entrepreneurial activities	70	19	11
Conduct evaluation of buildings, roads and other infrastructure and tree plantations in the area	30	25	45
Administrative roles the average perceived level of importance	44	22	34

4.5.1.6 Advisory roles

The study findings show that, on average, most, 95% of the AEOs respondents perceived the advisory roles as important. The study went further to investigate the level of perception on specific roles. Specifically, it was found that, 98% and 91% of the interviewed respondents mentioned that they were aware about their perceived level of importance of roles concerning advising smallholder farmers groups on making better decisions to increase agricultural production and on how to practice diversified agriculture, respectively.

4.5.1.7 Administrative roles

The study results show that, on average, only 44% of the AEOs respondents perceived that the administrative roles as important (Table 19). Specifically, 70% of the AEOs respondents indicated that they were aware about their perceived level of importance

about the role of undertaking entrepreneurial activities. Furthermore, less than half, 44% and 40% reported that they were aware about their perceived level of importance about coordinating and supervising different programmes, and work as ward or village executive officers, respectively.

Summary of role categories of AEOs perceived level of importance

Table 20: Distribution of AEOs according to their perceived level of importance

Role category	Average % of perceived level of importance		
	Importance	Moderate	Not Important
Facilitation	88	8	4
Organizational	93	6	1
Intermediation	78	15	7
Educational	90	8	2
Technical	90	8	2
Advisory	95	4	1
Administrative	44	22	34

The study results in Table 20 show that more than 80% of the respondents indicated their perceived level of importance on advisory, organizational, educational and technical roles. Others were facilitation and intermediation. High perceived level of importance on roles category could be due the fact that AEOs are given their job descriptions, which indicate what roles they are to perform and the expected outcomes. Also, in their real life situation they observe what exactly smallholder farmers need in order to move from low level of production to moderate/high levels.

4.5.2 General perception of AEOs toward extension work

According to McShane and Von Glinow (2015) as cited by Manik and Sidharta (2017) described perceptions as the process of receiving information and making it acceptable. Perception can shape a person's thoughts and behavior as not all information received can

be accepted by individuals. Therefore, understanding AEOs role perception it will help to know what AEOs believes on their roles as it have been mention before by Ibrahim *et al.* (2008) that role perception has great impact in job performance . McShane and Von Glinow (2015) defined role perceptions as the extent to which a person understands the job duties assigned. Also Manik and Sidharta (2017) stated that role perception help employees to understand better their work and do the job as good as possible. To gather information on AEOs perceptions, a five point Likert scale was used, which was as follows: strongly agree (SA); agree (A); undecided (U); disagree (D); and strongly disagree (SD). For the case of reporting the results, strongly agree (SA) and agree (A) were grouped together as agree (A) and undecided remained as (U), while disagree (D) and strongly disagree (SD) were grouped as disagree (D). Table 21 summarizes level of perception of AEOs on extension work.

Table 21: Distribution of respondents according to their perception on extension work in general

Statement	% level of perception		
	A	U	D
Overloaded with non-extension tasks	50	7	43
Lack of adequate management	45	18	37
Shortages of AEOs which leads to attend many farmers	91	4	5
Lack of in-service training	85	5	10
Inadequate logistics and other supports for AEOs	82	5	13
Disappointing due to farmers' lack or shortage of working capital	80	8	12
Poor perception towards extension work	72	8	20

4.5.2.1 Overloaded with non-extension tasks

Non-agricultural extension tasks in this study termed as all activities and efforts not directly related to agriculture or livestock production and other aspects of the value chain, but which are important to the farm families and to an organization as well. These

includes; administrative, tax collection, serving as Ward and Village Executive leaders. This can lead to AEOs not to perform roles as stipulated in their job description and may develop different perceptions on their roles. Findings in this study show that, half, 50% of the AEOs respondents perceived the extension work was overloaded with non-extension tasks. The study concur with that of Belay and Abebaw (2004) in south west-Ethiopia who reported that often AEOs were required to be involved in various non-extension activities. Petrovic *et al.* (2008) found that AEOs in extension work were in charge for many other duties, including administrative tasks and there were no strict division between extension work and other work/tasks. This can be one of the reasons that AEOs are blamed that their output in extension work is not visible. Maoba (2016) study in Germiston and Gauteng Province-South Africa asserted that AEOs have being criticized by some famers for not being visible, effective and efficient when doing their job.

4.5.2.2 Lack of adequate management

Many management thinkers have defined [management](#) in their own ways. For example management defined as an art and science of handling human and other material resources in organizations including schools (Ferdous, 2016; Araújo *at el.*, 2014; Poudyal, 2013) as cited by Mbalamula (2017). In that regard, management is a lynch-pin of all activities that are essential ingredients to guarantee positive results of pre-determined objectives and goals of organization (Uzuegbu and Nnadozie, 2015). Therefore inadequate management may result to employees having a different view on their work and failing to work at the expected level and can also lead to high staff turnover rates, with the most valued employees looking elsewhere for work. For example, in agricultural extension activities, AEOs may develop different perception on their roles which can lead to poor productivity. Fayol (1916) stated that “To manage is to forecast and plan, to organize, to command, to coordinate and to control”. In this study less than half, 45% of the AEOs respondents

perceived extension work as it lack adequate management. Petrovic *et al.* (2008) study on “Problems in the extension work and farmers’ needs in Serbia reported that AEOs perceived extension work lack of adequate management.

4.5.2.3 Shortages of extension personnel

The study findings show that, most, 91% of the AEOs respondents perceived extension work as faced with shortage of extension personnel which leads to attend many farmers (Table 20). Bilonkwamanagara (2008) study in Njombe District, Tanzania found that there were inadequate number of AEOs in the study area, hence they were not able to reach every farmer and few farmers receive agricultural extension services. According to (Belay and Abebaw, 2004; Ramorathudi and Terblanche, 2018) study in south west-Ethiopia and kweneng and southern districts- Botswana reported that AEOs were faced with heavy workloads of serving a large number of farmers. This implies that shortage of extension personnel can be one of the source their efforts in work not being visible by serving large number of farm families. During the study for example, in one of the FGDs one of the participant said that:

Due to lack of enough extension personnel in the District, majority of the extension personnel do attend farmers in more than two villages, which have large numbers of farm families, either some of the personnel have two or more wards to attend.

4.5.2.4 Lack of in-service training

An in-service training is a professional training or staff development effort, where professionals are trained and discuss their work with others in their peer group. Davis, (2019) stated that a key element in supporting agriculture’s role is information, which can be achieved through training. In-service training act as a catalyst for workers effectiveness, and also used as a way of updating workers skills and knowledge which lead to better job

performance. No matter how automated an organization may be, high productivity depends on the level of motivation and the effectiveness of the extension workforce (Mustapha *et al.*, 2017). Staff training is an indispensable strategy for motivating AEOs which also may influence their perception on extension work. In this study findings show that, most, 85% of the AEOs respondents perceived extension work as lack of in-service training. The results are in agreement with those of FAO (2008) which reported that lack of in-service training for AEOs weakens the knowledge on the job performance. This also may lead AEOs to have different perspectives on extension work which sometimes can be those that can hinder/reduce their job morale.

4.5.2.5 Inadequate logistics and other supports for AEOs

Provision of logistic support to AEOs have great impact on how they regard/ consider the extension work, this is due to the fact that availability of logistic support can help them to implement their planned work. Limited availability of logistic support may result to AEOs having different opinions about their extension work. Findings in this study show that, most, 82% of the AEOs respondents perceived extension work as being faced with limited availability of logistic support (Table 21). The findings are supported by Simelane *et al.* (2019) study in Eswatini, who reported that the AEOs perceived that thier extension work was under-resourced which made their work difficult, hence reduced their effectiveness and efficiency. Also, Mbenga (2015) reported that level of logistic support such as agricultural tools, agricultural equipments, literature, stationery, motorcycles, bicycles and cars were low in both public and private organizations. Similarly, Kimaro *et al.* (2010) study found that AEOs had low logistic support such as inadequate residential and office space. AEOs felt that, “their service centres were neglected in terms of resources, infrastructure upkeep, information dissemination and even water and sanitation, in

comparison to head offices and main service centres” (Zikhali, 2016). This implies that AEOs opinion on their extension work was influenced by not being given logistic support extension service execution.

4.5.2.6 Disappointing due to farmers’ lack or shortages of working capital

Along with fixed assets such as plan, equipment and land, working capital is considered as a part of operating capital (money). In this study, working capital was regarded as money that could help farmers to buy farm inputs so as to utilize the agricultural extension services executed by the AEOs. Lack or shortage of working capital may lead farmers not be able to purchase farm inputs such as fertilizers, agro-chemicals and improved seeds which AEOs expected farmers to perform. This may reduce the AEOs efforts in extension service delivery to farmers. In these study findings it surprised that, majority, 80% of the AEOs respondents perceived extension work as disappointing due to most smallholder farmers’ lack/shortage of working capital (Table 21). Also study by Petrovic *et al.* (2008) in Serbia found that most smallholder farmers were not able to apply the advice given by AEOs which required credits for investment. Furthermore, Belay (2002) study on constraints to agricultural extension work in Ethiopia found that (88%) respondents reported that farmers’ lack or shortage of working capital as an important barrier to the adoption of modern agricultural inputs. This implies that sometimes efforts in work can be influenced by seeing the output of the service given. For example AEOs can increase motivation for work if smallholder farmers were to implement their extension services given to them and vice versa.

4.6 Factors Influencing AEOs Perceptions on Their Roles

Many scholars define perception differently. According to Norman *et al.* (1982) defined perception as a process by which people select, organize and interpret sensory stimulation into a meaningful and coherent picture of the world. However, Van den Ban and Hwakins (1996), stated perception as the process by which we (individuals or a group of people) receive information or stimuli from our environment and transform it into psychological awareness. And from these awareness an individual or group of people may develop different perception. In any organization the individuals' role perception and its performance are essential to the survival and achievement of the organizational goals and effectiveness (Ovwigbo, 2015). The performance of AEOs depends on several aspects, as one of it can be the perception on their roles. Ajieh, (2009) stated that any discrepancy between AEOs role perception could result in ineffectiveness in job execution. This study objective intended to assess whether the factors discussed below influenced the AEOs perception on their roles.

4.6.1 Agricultural Extension Officers attending training

Davis (2019) states that a key element in supporting agriculture's role is conveying agricultural information through training. Extension programs delivered by AEOs today are more varied than ever and will continue to change to meet the needs of the clients they serve. Thus, training of AEOs is an integral part of the overall agricultural production process (Al-Zahran *et al.*, 2017; Saleh *et al.*, 2016). Through trained AEOs new agricultural technologies can easily and favorably be transferred to clientele (Saleh *et al.*, 2016). Training can make AEOs to love their job and do it well because it makes them to be aware of their roles, competence and know to what extent their efforts are required to improve agricultural production and productivity. Training aims to equip AEOs with skills and competencies (Chizari *et al.*, 2011). As they need to have competences such as

teamwork, communication, and leadership (the ability to understand the diverse views of farmers and farming issues) which are not addressed in detail in colleges and university classrooms (Movahedi and Nagel, 2012). In this study, AEOs were requested to report if they had attended in-service training in five past years. Study results showed that, majority 85% did not attend any training while, only 15% of the AEOs reported to had attended training lasting from 1-3 weeks. Khan (2017) also found that one of the challenges faced AEOs was lack in-service training. This implies that AEOs lack training, which is an important aspect for better job performance. Table 17 below summarizes the information on the training attended by 15 AEOs respondents.

Table 22: AEOs respondents training attended from 2013 to 2018

Name of the course	Major theme	Duration	Year
Entrepreneurship	Bee keeping	1 week	2013
Animal disease	Control of east coast fever	1 week	2013
Crop storage	Use of pics bags	1 week	2013
Organic farming	Production of cotton organically	1 week	2013
Carrying out responsibilities	Report writing	1 week	2014
Maize production	Lubango hybrid	1 week	2016
Fertilizer-TFRA	Fertilizer use and laws	1 week	2017
TOSCI-seed	Seed regulations	1 week	2017
Farm business	GAP (good agricultural practices	3 weeks	2017
Cotton production	Seed quality	2 weeks	2017
Tanzania Social Action Fund(TASAF)	Improving livelihood of poor household	1 week	2018
Artificial insemination	Artificial insemination technology	3week	2018

The training attended shown in Table 21 by the AEOs in the study area mostly were in extension based courses. This implied that AEOs had acquired the knowledge and skills which improved their competence in their job performance.

4.6.2 Supervision

Supervision is defined as the supervisors' accessibility, ability, and willingness to guide, motivate, teach, and fairly treat subordinates. Honadle (1982) stated that one factor which may be necessary in order to convert resources into services is adequate supervision. So supervision in agricultural extension services is also crucial as it helps to check whether farmers get the required services for improving agricultural production and productivity.

4.6.2.1 Number of field visit

Visiting AEOs to their workplaces makes them feel closer to their supervisors. The meaningful visit in agricultural extension goes hand to hand with giving schedule of activities which shows the day and date of the supervisors' arrival. This helps AEO to be visited to prepare for the visit and share challenges that he/she face in the area, as the supervisor usually are more knowledgeable. For example, emerging of plant diseases, to look after plants diseases in the fields sound better than if the problem is reported to a person who is far away. Due to necessity of AEOs visits, the study wanted to know whether they were visited by their supervisors. In this study, findings showed that all of the AEOs respondents reported to had been visited by field supervisors, but had no schedule of their supervisors' arrival. Months that supervisors visited AEOs in the field varied. For example, over two thirds, 69% reported that they were visited once per month by their supervisors (Table 23). This situation can lead to lack of strong link between field AEOs and those at district level which affect the overall performance of extension services. Christoplos (1996) reported that as visits from supervisors become rarely, vertical links consequently become weaker. In addition, in one of the FGDs one of the participant said that:

Schedules of visits for AEOs to their work station were not provided because even at District level we do not prepared schedules, since there is no guarantee of

getting fuel for supervisors' transport to check the AEOs' activities that they perform in the field, this leads to only few or no AEOs being visited in a month.

4.6.2.2 Mode of supervision

Mode of supervision in this context was termed as how AEOs presented field situation to their supervisor. Ideally, agricultural extension service involves the flow of information from different levels: can be from village, ward, district, regional and national levels. Mattee (1989) reported field situation (information) was given in form of reports which most of which were never read. As a result, AEOs in the field are not always up-to-date on new technologies or extension policies, and feedback rarely reaches the top levels of the organization where decisions are then made based on wrong assumptions and without a full understanding of the problems and concerns of farmers (Mattee, 1994). For example, in this study result in Table 23 show that, 45% of the AEOs respondents reported that they prepared the work reports and sent them to their district supervisors' using public transport or giving to a person who was instructed to deliver it to district supervisor. Few, 28% and 27% of the respondents reported meet with supervisor at district headquarter and being visited to their work station respectively. This implies that AEOs were not used to meet with their supervisors' which actually hinder transparency in message delivery from the field.

Table 23: Distribution of respondents according to supervision (n= 100)

Variable	Frequency	%
Whether have someone to supervise		
Yes (have someone to supervise)	100	100.0
No (do not have someone to supervise)	0	0.00
Whether know the schedule of activities of supervisor		
No(do not know the schedule of activities)	100	100.0

Yes (know the schedule of activities)	0	0.0
No(do not know the schedule of activities)	100	100.0
Number of Field visit by supervisor		
One time in a month	69	69.0
Two times in a month	18	18.0
Three times in a month	6	6.0
Four times in a month	7	7.0
Mode of supervision which frequently used		
He/she visit me at my work station	27	27.0
I meet with him / her at district headquarter	28	28.0
I just prepare my report and send it to him/her	45	45.0

4.6.3 AEOs owning transport and type of transport

Large percentage of agricultural activities takes place in rural areas, where farm families area more isolated. As mentioned early that 90% of these farm families depends in agriculture (NBS, 2018). For these farm families to access agricultural extension services public AEOs are the main key players in extension service delivery. AEOs require different support in facilitating their work, one of them is transport for visiting farmers. Transport helps AEOs to visit many farmers and timely (at specific time which service is required). For example, with transport AEOs will be able to reach farmers at production stages such as at sowing, weeding, harvesting and at storage periods as well as finding markets. Hence, it is not only availability of transport but also the ownership and type of transport matters. This helps the AEOs to plan for their schedule of activities and implement them. For example, those who own motorcycles can plan to visit many farmers than those with bicycles. In this study findings in Table 24 show that, over half, 58% of the AEOs respondents reported to own transport, in which 49% and 9% owned motorcycles and bicycles, respectively (Table 24).

The ownership of motorcycle may be associated by most of AEOs reported to work at ward level with many villages to save. Mbenga (2015) study in Handeni, reported that out

of the 53 AEOs respondents, 49% were having transport where as 26% and 23% owned motorcycles and bicycles, respectively. However, the performance of AEOs still invisible may be due to the lack of fund to Districts not being giving support in buying fuels and maintenance of the transport which they own. Rutatora and Matee (2001) also reported on the inability of many Districts in Tanzania to fund extension services from their own sources.

Table 24: Distribution of AEOs according to the transport type and ownership

Variable	Frequency	%
Whether AEO owning transport		
Yes	58	58.0
No	42	42.0
Total	100	100.0
Type of transport used		
Motorcycle	49	49.0
Bicycle	9	9.0
Total	58	58.0
If does not own transport, what type of transport used		
Walking	32	32.0
Public Transport	9	9.0
Any other transport (hire private transport)	1	1.0
Total	42	42.0

4.6.4 Promotion in an organization

Promotion can be defined differently depending on the situation. In this context promotion was regarded as the [act](#) of [raising](#) someone to a [higher](#) or more [important position](#) or [rank](#). Promotion is one of the aspect that motivates people to perform their work at the required level. It always individual performance which used to be considered for preparing individual promotion. But sometimes some of the people do perceive that promotion is conducted by considering the working years of an individual in an organization. McCaslin and Mwangi (1994) study on AEOs from Kenya"s rift valley reported that promotion led to frustration because the AEOs felt promotion was more on the basis of years of service and not on individual performance. This implies that AEOs work performance is motivated by being promoted. This study findings showed that 68% of the AEOs reported promotion motivated them in performing extension roles. Hence employee's promotion are more likely to reinforces highly work motivation. Zelalem (2011) study also showed there was positive relation between promotion and AEOs motivation at work.

4.6.5 Responsibility

In this context, responsibility was defined as the state or fact of being given authority/ accountable for performing a particular task. In agricultural extension services, AEOs worked in remote areas and they rarely meet with their supervisor. As being assigned with various roles the responsibility/ authority for them to perform their duties is necessary especially to those which sometimes require them to make decisions on behalf of their supervisors. In this study findings show that, 83% of the AEOs were motivated to perform their extension roles by being given authority to make necessary decision. It is expected that as AEOs given responsibility to make ultimate decision on the issues under his/her responsibility, she/he may motivated more (Abo and Lefebo, 2018).

4.6.6 Appreciation

William James, the father of psychology, stated that the most fundamental psychological need is to be appreciated (Colan, 2017). The good news is that we have complete control over our appreciation. No budget is required, since there are literally thousands of ways to demonstrate our appreciation at little or no cost. For example, appreciation as a reward to employees can be given by giving a letter or certificates, telling good words as reported by Negara (2014) it increased the AEOs work motivation. For the case of this study, appreciation was considered as the [act](#) of [recognizing](#) or [understanding](#) that someone is [valuable](#) and [important](#) due to his/ her contribution in work. This study findings show that, 86% of the AEOs were motivated to perform their extension roles by being appreciated for work.

4.6.7 Relationship with supervisors

Supervisor is a person who monitors and regulates employees in their performance of assigned or delegated tasks, they are usually authorized to: directing; disciplining; promoting; punishing; rewarding; and other associated activities regarding the employees

in their departments (Stock, 2015). In agricultural extension services, a supervisor, therefore, is expected to provide leadership and support to AEOs in executing their jobs (Honadle, 1982). Supervisor's relationship with AEOs helps to create a work climate which is supportive to AEOs for them to do their job better, rather than to punish them for doing it poorly. Good relationship with supervisors makes AEOs to be free to ask for assistants on different challenges in their work station. Also, it motivates the AEOs in job execution. Table 25 in this study show that, 86% of the respondents reported that good relationship with their supervisor's motivated them in performing extension roles.

Table 25: Distribution of AEOs according to the factors that motivated them to perform extension roles (n=100).

Statement	% level of responses		
	Agree	Undecided	Disagree
Promotion in an organization motivates in performing extension roles	68	11	21
Responsibility motivates in performing extension roles	83	11	6
Appreciation for work motivates in performing extension roles	86	8	6
Relationship with supervisor motivates in performing extension roles	86	9	5

4.7 Multiple Regression Analysis on Factors Influencing Perceptions of AEOs on Their Roles

Before running a multiple regression analysis on factors that predicted the perception of AEOs on their roles, the following diagnostics tests were done. These included test for multicollinearity, Durbin-Watson's d tests, and heteroscedasticity.

4.7.1 Test for multicollinearity

Multicollinearity diagnostics test was done in order to detect whether there was a correlation among the independent (X_i) variables. Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model (Andy, 2009). The test result shows that age, salary and working experience had 12, 16 and 26 Variance Inflation Factor (VIF) respectively. According to Pallant (2011) for variables with a tolerance value of $VIF > 10$ implies that it had multicollinearity. Thus these variables were deleted from the model. Then the remaining variables with VIF less than 10 implied that there was no violation of the multicollinearity assumption in this current study.

4.7.2 Durbin-Watson's d tests

In addition, Durbin-Watson's d test was used to test for auto-correlations. The results showed that the Durbin-Watson's was 1.79 and 2.53 which falls within the values of $1.5 < d < 2.5$ (implying that there was no auto-correlation) (Kutner *et al.*, 2005). Hence, there was no auto-correlation in the multiple linear regression model for this study.

4.7.3 Testing for heteroscedasticity

Based on the scatter plot output, the results show that there was no clear pattern, which was an indication that there was no problem with heteroscedasticity.

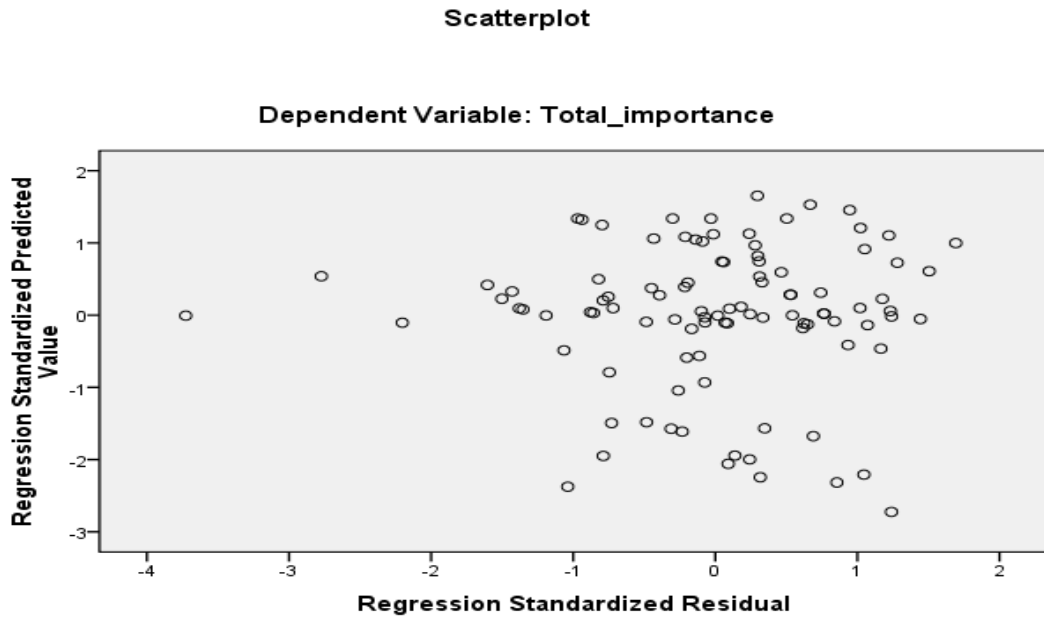


Figure 2: Scatterplot

Independent variables involved in the multiple regression model were: sex, education qualification, attending training, mode of supervision, frequency of supervision, owning transport, type transport, nature of work, promotion in an organization, responsibility, appreciation, working condition, relationship with supervisor and relationship with peer. As indicated previously, age, salary and working experience showed 12, 16 and 26 Variance Inflation Factor (VIF), which usually a variable tolerance should be less than 10 to qualify for its multicollinearity. Hence, these variables were deleted from the model. Below is a discussion of the above mentioned variables after multiple linear regression.

Table 26: Factors influencing perceptions of AEOs on their roles (n=100)

Factor	Unstandardized coefficient		Standardized coefficient	t	Sig.	Collinearity	
	B	Std. error				Tolerance	VIF
Constant	47.993	12.874		3.728	.000		
Sex	2.835	2.599	.058	1.091	.278	.784	1.275
Education	1.380	1.521	.044	.907	.367	.935	1.070

qualification							
Attending training	-.223	2.278	-.005	-.098	.922	.846	1.183
Mode of supervision	-2.150	1.071	-.112	-2.007	.048*	.709	1.411
Number of supervisor's visits	1.097	.974	.061	1.126	.263	.746	1.340
Owning Transport	9.509	3.210	.296	2.963	.004*	.223	4.488
Type of transport	4.486	1.712	.269	2.621	.010*	.211	4.742
Promotion in an organization	12.520	.766	.862	16.346	.000*	.799	1.252
Responsibility	3.122	1.186	.160	2.633	.010*	.603	1.658
Appreciation	3.064	1.107	.173	2.768	.007*	.566	1.765
Relationship with supervisor	.902	1.221	.049	.739	.462	.512	1.953

$R^2=0.816$; $p \leq 0.05$; Durbin-Watson=1.797

Sex had a beta co-efficient of 0.058, and was not statistically significant ($p \leq 0.278$) at $p \leq 0.05$. This meant that males had a high perception their job than females. However, the influenced of the sex was not significant. Education qualification of the AEOs had a beta co-efficient of 0.044, and the variable was not statistically significant $p \leq 0.367$ at $p \leq 0.05$. This meant that increase in education qualification AEOs increase the AEOs perception on their roles. Attending training of the AEOs had a beta co-efficient of -.005, and this variable was not statistically significant ($p \leq 0.922$) at $p \leq 0.05$. The negative beta coefficient implied that the AEOs who did not attend training had low perception on their job roles. This implied that attending training increases the perception of the AEOs on their roles (Table 26). Since, getting chances of training AEOs can be equipped well with new technology and can face the challenges in the modern agriculture.

In addition, mode of supervision was included in the regression model, and had a beta coefficient of -0.112 , which was statistically significant ($p \leq 0.048$). The negative beta coefficient implied that the mode of supervision which had no AEOs contact with their supervisor lead to decrease AEOs perception on their roles. This meant that increasing supervision by visiting the AEOs at work station increased their perception on their roles. Number of supervisor's visits had beta co-efficient of 0.061 , and was not statistically significant ($p \leq 0.263$). This implied that increased the number of supervisor's visits (once per month, twice a month, three times a month, four times a month) increase the perception of the AEOs on their roles. Another variable included in the regression model on owning transport, which had a beta co-efficient of 0.296 , and was highly statistically significant ($p \leq 0.004$) (Table 26). This implied that AEOs owning transport increase the perception on their roles. This meant that if most AEOs acquired transport it could increase their perception on their roles. Additionally, the variable of type of transport had beta co-efficient of 0.269 . This variable was statistically significant ($p \leq 0.010$). This implied that the AEOs who owned motorcycle had high perception on their roles.

Employee promotion did influence their perception on job roles. It had a beta co-efficient of 0.862 and was highly significant ($p \leq 0.001$) (Table 26). This meant that one unit increase on employee promotion score increased 0.862 on the perception on AEOs roles. This implied that individual AEOs receiving promotion had higher perception on the their job roles. Bezu *et al.* (2016) study in Ethiopia also found that there were significant and positive association between promotion and AEOs' roles. Furthermore, the variable responsibility had a beta co-efficient of 0.160 , and was statistically significant ($p \leq 0.010$). This meant that AEOs responsibility (authority to make necessary decision in order to complete assigned work) increases the perception on their roles, hence they will be in position to offer their full potential to a given task for high productivity. The

regression model in Table 26 also shows that appreciation had a beta co-efficient of 0.173. This variable was highly statistically significant ($p \leq 0.007$). This implied that AEOs appreciation for their work increases perception on their roles. Appreciation as an incentive, offered at relatively low cost but have a high impact means of reward to workers, it can be done through distribution of certificates [letters, a mention to peers] and gold nameplates to well performing extension employees (Mustapha *et al.*, 2017). In addition, in one of the FGDs one of the participants said that:

AEOs appreciation increases their work performance in our district through checking their work reports. Those reporting good work they are praised during the monthly departmental meetings and they get appreciation letters for the good work done. Also, they get certificates of appreciation of being best workers during the 8-8 Day.

AEOs relationship with their supervisors' had a beta co-efficient of 0.49, and was not statistically significant ($p \leq 0.462$) (Table 26). This implied that relationship with supervisors increases AEOs the perception on their roles.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The findings of this study show that most of interviewed AEOs perceived their mandated roles namely advisory, organizational, educational, technical, facilitation and intermediation as important for effective performance of extension advisory services. However the AEOs perceived that the fulfillment of these important roles becomes difficult due to various aspects. These include agricultural extension officers overloaded with non-extension tasks like tax collection that hinder them to perform their technical roles, shortages of extension offers that lead to AEOs serving large number of farm families, lack of in-service training which resulted to low competence in performing their mandated roles, inadequate logistics such as motorcycles, bicycles, cars, agricultural tools and equipments etc , disappointment due to farmers' lack or shortages of working capital. These have resulted to extension officers being blamed for not performing roles as stipulated in their job description as expected.

5.2 Recommendations

Based on the conclusions above, it is recommended as follows:

1. The DAICOs in five study districts should allocate funds for regular training of AEOs and provide support in terms of infrastructure for the AEOs such as transportation including fuel, allowances, office space and teaching aids for effective and efficiency role performance. This will avoid or minimize AEOs to engage in non-extension activities such undertaking entrepreneurial activities which sometimes they use working hours.

2. Extension service must be provided to farm families to satisfy their needs and attain the goal of extension service as stated in National Agricultural Policy of 2013 that “Extension services are crucial in supporting poverty reduction in rural areas and market competitiveness for commercial agriculture in the domestic and global markets. This can be achieved through the development of curriculum which will make sure that extension personnel are equipped with necessary knowledge and skills to help farm families. Also job description of AEOs need to match with what is taught in the institutions, and agricultural tools and equipments in performing these roles must be provided.

3. AEOs need to concentrate more on their mandated roles and not non extension work. These can be achieved by making sure that DAICOs have close supervision of AEOs through visiting rather than relying on reports submitted by them.

4. Policy makers need to come up with the effectively and efficiency extension service approach in which every AEOs will have to follow when executing his/her duties.

REFERENCES

- Abdu-Raheem, K. A. (2013). The role of agricultural extension in promoting food security in the context of encouraging biodiversity conservation in South Africa: the case of KwaZulu-Natal. Doctoral dissertation for Award Degree at University of KwaZulu-Natal. 209pp.
- Abo, D. and Lefebo, N. (2018). Factors Influencing Job Performance of Development Agents: The Case of Soro Woreda of Hadiya Zone, Southern Ethiopia. *European Journal of Business and Management* www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol.10, No.1, 2018.
- Adekunle, O. O. (2013). The role of home gardens in household food security in Eastern Cape: A case study of three villages in Nkonkobe Municipality. *Journal of Agricultural Science* 5(10): 63-67.
- Ajieh, P. C. (2009). Congruency between role perception and role performance of agricultural extension agents in Delta State, Nigeria. *Nigeria Agricultural Journal* 40(1-2).
- Agricultural for Impact (2015). Agricultural Extension. [<https://ag4impact.org/sid/socio-economic-intensification/building-human-capital/agricultural-extension>] site visited on 14th October 2019.
- Al-Zahrani, K. H., Aldosari, F. O., Baig, M. B., Shalaby, M. Y. and Straquadine, G. S. (2017). Assessing the Competencies and Training Needs of Agricultural Extension Workers in Saudi Arabia. *Journal of Agricultural Science and Technology* 19(1): 33-46.

- Anaeto, F. C., Asiabaka, C. C., Nnadi, F. N., Ajaero, J. O., Aja, O. O., Ugwoke, F. O., Ukpongson, M. U. and Onweagba, A. E. (2012). The Role of Extension Officers and Extension Services in the Development of Agriculture in Nigeria. *Journal of Agricultural Research* 1(6): 180-185.
- Araújo, D. R., Sampaio, F. M. C., Castro, M.C., Pinheiro, S. A. V. and Macedo, A.P. (2014). Testing in time: from the classical management theory to the current organization of Nursing work”. *Revista de Enfermagem Referência Série IV* (2): 111-119.
- Auvine, B, Densmore, B., Extrom, M., Poole, S. and Shanklin, M. (2002). What do we mean by facilitation. *Group Facilitation: A Research and Applications Journal* 4: 53-55.
- Babbie, E. R. (1990). *Survey Research Methods* Wadsworth. Publishing Company, California. 395pp.
- Baig, M. B. and Aldosari, F. (2013). Agricultural extension in Asia: Constraints and options for improvement. *Journal of Animal Plant Science* 23: 619-632.
- Baloch, M. A. and Thapa, G. B. (2018). The effect of agricultural extension services: Date farmers’ case in Balochistan, Pakistan. *Journal of the Saudi Society of Agricultural Sciences* 17(3): 282-289.
- Barone, A. (2019). Technical Job Skills. [<https://www.investopedia.com/terms/t/technical-job-skills.asp>] site visited on 2nd October 2019.
- Belay, K. (2002). Constraints to agricultural extension work in Ethiopia: the insiders' view. *South African Journal of Agricultural Extension* 31(1): 63-79.

- Belay, K. and Abebaw, D. (2004). Challenges facing agricultural extension agents: A Case Study from South-western Ethiopia. *African Development Review* 16(1): 139-168.
- Bernard, J. M. and Goodyear, R. K. (2004). *Fundamentals of Clinical Supervision* (3rd ed.). Boston: Allyn and Bacon. 89pp.
- Bernard, H. R. (1994). *Research Methods in Anthropology, Qualitative and Quantitative Approaches*. Sage publications, London. 585pp.
- Bezu, D. C., Eric, N. O. and Jemal, Y. H. (2016). Factors influencing work motivation of development agents: The case of Agarfa and Sinana Districts, Bale Zone, Oromia Regional State, Ethiopia. *International Journal of Agricultural Science Research* 5(1): 1-18.
- Biddle, B. J. (1979). *Role Theory: Expectations, Identities, and Behaviors*. Academic Press New York. 416pp.
- Biddle, B. J. (1986). Recent developments in role theory. Center for Research in Social Behavior, University of Missouri-Columbia, Columbia, Missouri 65211. *Annual Review of Sociology* 12(1986): 67-92.
- Bilonkwamanagara, M. F. (2008) Role of Informal Agricultural Information Dissemination Networks in Poverty Alleviation in Njombe District, Tanzania, Unpublished MA Rural Development Dissertation for Degree Award at Sokoine University of Agriculture, Tanzania. 89pp.
- Birner, R., Davis, K., Pender, J., Nkonya, E., Anandajayasekeram, P., Ekboir, J., Mbabu, A., Spielman, D. J., Horna, D., Benin, S. and Kisamba-Mugerwa, W. (2006). *From best practice to best fit: A framework for designing and analyzing*

agricultural advisory services. ISNAR Discussion Paper No. 5. Washington, D.C.: IFPRI.

Bortamuly, D. (2015). A study on the role performance of the agricultural extension personnel in the revitalized extension system in the state of Assam. Doctoral Dissertation for Award Degree at Assam Agricultural University. 126pp.

Boyaci, M. and Yildiz, O. (2016). An overview of agricultural extension services in Turkey. *Bulgarian Journal of Agricultural Science* 22: 151-157.

Chami, A. A. (2018). Women Participation in Cotton Farming in Simiyu Region, Tanzania: Undefined Paradoxical Praxis. *Current Investigations in Agriculture and Current Research* 1(3): 1-9.

Chiligati, J. E. (2010). Factors influencing research-extension-farmer linkages in Tanzania: a case of the Western agricultural research zone. Doctoral Dissertation for Award Degree at Sokoine University of Agriculture. 121pp.

Chisita, C. T. (2010). An investigation into the use of ICT in the provision of agricultural information to small scale farmers in Harare. In *World Library and Information congress: 76th IFLA General Conference and Assembly*. pp. 10-15.

Chizari, M., Namdar, R. and Gholamreza, P. R. (2011). An analysis of training needs of evaluation professionals of agricultural and extension programs in Iran. *Agricultural Extension and International Journal of Scientific and Research Publications* 6(2): 2250-3153.

Christoplos, I. (1996). *Poverty, pluralism and extension practice*. London: IIED. 36pp.

Christoplos, I. (2010). *Mobilizing the Potential of Rural and Agricultural Extension*. FAO, Rome. 64pp.

- Christoplos, I. and Kidd, A. (2000). *Guide for Monitoring, Evaluation and Joint Analysis of Pluralistic Extension Support*. Neuchâtel Group and Swiss Centre for Agricultural Extension and Rural Development, Lindau, Switzerland. 22pp.
- Colan, L. (2017). Ways to Show Your Appreciation. [<https://www.inc.com/lee-colan/7-ways-to-show-your-appreciation.html>] site visited on 4th October 2019.
- Coleman, J. S. (1990) *Foundation of Social Theory*. Cambridge, MA: Harvard University Press. 1014pp.
- Danijela, Š., Slobodan, L., Vesna, Đ., Dragan, M., Danijela, V., Brankica, L. and Milan, M. (2011). The role of consumers' perception and attitude in purchasing of meat and meat products. *Tehnologija mesa* 52(2): 283-290.
- Davis, K., Nkonya, E., Kato, E., Mekonnen, M., Odendo, M., Miiro, R. and Nkuba, J. (2010). Impact of Farmer Field Schools on Agricultural Productivity and Poverty in East Africa, IFPRI Discussion Paper 00992, International Food Policy Research Institute, Washington, DC. [<http://www.ifpri.org/sites/default/files/publications/ifpridp00992.pdf>] site visited on 27/11/2018.
- Davis, K., Lion, K. and Arokoyo, T. (2019). Organisational capacities and management of agricultural extension services in Nigeria: current status. *South African Journal of Agricultural Extension* 47(2): 118-127.
- Dube, M. A. (1993). Perceptions of field officers, extension officers and farmers regarding agricultural extension education in Swaziland. Retrospective Thesis and Dissertations for Award Degree at Iowa State University Capstones. 238pp.

- Elifadhili, D. (2013). Assessment of agricultural extension services in Tanzania. A case study of Kyela, Songea Rural and Morogoro Rural Districts. Internship Report, Wageningen University and Research Center, Wageningen, The Netherlands.
- FAO, Food and Agriculture Organization of the United Nations (2008). *Global Review of Good Agricultural Extension and Advisory Service Practices*. Research and Extension Division, Rome, Italy. 64pp.
- FAO, Food and Agriculture Organization of the United Nations (2017). Integration of Nutrition in Agriculture Extension Services in Africa. A desk review of country case studies pre-service and in-service training material.
- Fayol, H. (1916). General principles of management. *Classics of Organization Theory* 2(15): 57-69.
- Ferdous, J. (2016). Organization theories: from classical perspective. *International Journal of Business, Economics and Law* 9(2): 1-6.
- Fischer, E. and Qaim, M. (2012). Linking smallholders to markets: determinants and impacts of farmer collective action in Kenya. *World Development* 40(6): 1255-1268.
- Honadle, G. (1982). Supervising agricultural extension: practices and procedures for improving field performance. *Agricultural Administration* 9(1): 29-45.
- Haile, M. and Abebaw, D. (2012). What factors determine the time allocation of agricultural extension agents on farmers' agricultural fields? Evidence from rural Ethiopia. *Journal of Agricultural Extension and Rural Development* 4(10): 318-329.

- Idrisa, Y. L. and Ogunbemar, B. O. (2012). Analysis of the refresher training courses attended by Extension Workers in Borno State, Nigeria. *Greener Journal of Agricultural Sciences* 2(2): 046-052.
- Issahaku, A. (2014). Perceived competencies of agriculture extension workers in extension services delivery in northern region of Ghana: Perspectives from literature. *Developing Country Studies* 4(15): 95-107.
- Ibrahim, H., Muhammad, D. M., Yahaya, H. and Luka, E. G. (2008). Role perception and job satisfaction among extension workers in Nasarawa Agricultural Development Programme (NADP) of Nasarawa State, Nigeria. *Production Agriculture and Technology* 4(1): 62-70.
- Ibrahim, H., Zhou, J., Li, M. and Chen, Q. (2014). Perceptions of Farmers on Extension Services in North Western Part of Nigeria: The Case of Farming Households in Kano State. *JSSM Journal of Service Science and Management* 07(02): 57-62. doi:10.4236/jssm.2014.72006.
- Kimaro, W. H., Mukandiwa, L. and Mario, E. Z. J. (2010). Towards improving agricultural extension service delivery in the SADC Region. *Proceedings of the Workshop on Information Sharing among Extension Players in the SADC Region, Dar es Salaam, Tanzania* 26 - 28 July 2010. pp. 1 – 12.
- Kimaro, D. N. and Hieronimo, P. (2014). Land for Agriculture in Tanzania: Challenges and Opportunities. *Journal of Land and Society* 1(1): 91-102.
- Kitson, A., Harvey, G. and McCormack, B. (1998). *Enabling the implementation of evidence based practice: a conceptual framework. Quality and Safety in Health Care* 7(3): 149–158.

- Komba, N. C., Mlozi, M. R. S. and Mvena, Z. S. K. (2018). Socio- economic factors influencing farmers' perception on effectiveness of decentralized agricultural extension information and services delivery in Arumeru District, Tanzania. *International Journal of Agricultural Extension and Rural Development* ISSN 6(2): 594–602.
- Koutsouris, A. (2012). Facilitating Agricultural Innovation Systems: a critical realist approach. *Studies in Agricultural Economics* 114(1316-2016-102761): 64-70.
- Kumar, P., Kaur, P. and Kalra, R. K. (2013). American International Journal of Research in Humanities, Arts and Social Science. Role Expectations, Role Perceptions and Role Performance of Extension Personnel. *American International Journal of Research in Humanities, Arts and Social Sciences* 4(1): 6-13.
- Kunwar, N. (1989). Roles of field level agricultural extension workers in Nepal as perceived by agricultural extension personnel.
- Kutner, M. H., Nachtsheim, C. J., Neter, J. and Li, W. (2005). *Applied Linear Statistical Models* (Vol. 5). Boston: McGraw-Hill Irwin.
- Kjejcic, R. V. and Morgan, D. W. (1970). *Determining Sample Size for Research Activities*. Educational and Psychological Measurements, University of Minnesota. 607-610pp.
- Khan, M. Z. (2017). The Competencies regarding administrative and supervisory role of the agricultural extension officers in the rural and agricultural development of Pakistan. *Sarhad Journal of Agriculture* 33(3): 412-418.
- Li Pun, H. H. and Koala, S. (1994). Priority Setting in Agricultural Research: a comparison of different types of networks.

- Manik, E. and Sidharta, I. (2017). The impact of academic service quality on student satisfaction.
- Mauki, C. R. and Ngowi, A. R. (2018). Value Chain Approach Limitations to Agricultural Extension Training Among Extension Staff in Maize.
- Magesa, M. M., Michael, K. and Ko, J. (2014). Access to Agricultural Market Information by Rural Farmers in Tanzania. *International Journal of Information and Communication Technology Research* 4(7): 7–9.
- Maoba, S. (2016). Farmers' perception of agricultural extension service delivery in Germiston Region, Gauteng Province, South Africa. *South African Journal of Agricultural Extension* 44(2): 167-173.
- Mattee, A. Z. (1994). Reforming Tanzania's Agricultural Extension System: The Challenges Ahead. *African Study Monographs* 15(4): 177-188.
- Mattee, A. Z. (1989). Accessibility of agricultural services to small-scale farmers in Tanzania. In: *Communication Methods for Effective Agricultural Technology Transfer in Tanzania*. 56pp.
- Mbega, W. L. (2015). Factors affecting the job performance of agricultural extension workers in Handeni District, Tanzania. Doctoral dissertation for Award Degree at Sokoine University of Agriculture. 95pp.
- Mcharo, A. C. (2013). Perception of farmers on effectiveness of agricultural extension agents in knowledge transfer to maize growers in Kilindi District. Dissertation for Award Degree of Master of Arts in Rural Development for Sokoine University of Agriculture. Morogoro, Tanzania. 60pp.

- McCaslin, V. L., and Mwangi, J. (1994). Job satisfaction of Kenya's rift valley extension agents. *Journal of Extension* 32(3): 1-13.
- McLagan, P. A. (1989). Models for HRD practice. *Training and Development Journal* 43(9): 49-60.
- McShane, S. L. and Von Glinow, M. A. (2015). *Organizational Behavior 7/e*. McGraw-Hill Education.
- Mcharo, A. C. (2013). Perception of farmers on effectiveness of agricultural extension agents in knowledge transfer to maize growers in Kilindi district. Doctoral Dissertation for Award Degree at Sokoine University of Agriculture. 82pp.
- Mbalamula, Y. S., Suru, M. H. and Seni, A. J. (2017). Utility of Henri Fayol's Fourteen Principles in the Administration Process of Secondary Schools in Tanzania.
- Msuya, C., Annor-Fremgpong, F., Magheni, M., Agunga, R., Igodan, C., Ladele, A. and Ndiaye, A. (2017). The Role of Agricultural Extension in Africa's Development , the Importance of Extension Workers and the Need. *International Journal of Agricultural Extension* 5(1): 59-70.
- Movahedi, R. and Nagel, U. J. (2012). Identifying Required Competencies for the Agricultural Extension and Education Undergraduates. *Journal of Agricultural Science and Technology* 14(4): 727-742.
- Mubofu, C. and Elia, E. (2017). Disseminating Agricultural Research Information: A case study of farmers in Mlolo, Lupalama and Wenda villages in Iringa district, Tanzania. *University of Dar es Salaam Library Journal* 12(2): 80-97.

Mustapha, S.B, Alkali A., Shehu, H. and Ibrahima A. K (2017). Motivation Strategies for Improved Performance of Agricultural Extension Workers in Nigeria. *International Academic Journal of Organizational Behavior and Human Resource Management* 4(1): 1-8.

National Bureau of Statistics, NBS (2018). Tanzania in Figures.

Negera, D. G. (2014). Analyzing Determinants of Development Agents' Motivation in Agricultural Extension Services Provision: A Case from South West Shoa Zone, Oromia Regional State, Ethiopia: *International Journal of Agricultural Extension and Rural Development* 1(3): 26-30.

Newcomb, T. M. (1951). Social psychological theory: integrating individual and social approaches.

Ngwenya, H. and Hagmann, J. (2007). Facilitation for Change: Triggering emancipation and innovation in rural communities in South Africa. *Farmer First Revisited, Practical Action Publishing, Rugby 2007: 220-228.*

Nwaogu, F. K. and Akinbile, L. A. (2018). Competencies of agricultural development programme personnel in extension service delivery in Oyo and Ogun States Nigeria. *Journal of Agricultural Extension* 22(3): 40-52.

Norman, G. Harlow, H. F., Jones, L. V. and Stevenson, H. W. (1982). Occupational Stress: Coping and Health Problems of Teachers. *The Journal of School Health* 51: 175 – 181.

Okwoche, V. A., Ejembi, E. P. and Obinne, C. P. O. (2011). Professional competencies perceived to be important and needed by female and male agricultural extension agents: A study from Nigeria. *Journal of Agricultural Sciences* 2(2): 121-126.

- Oladele, O. I. (1999). Analysis of the institutional Research-Extension-farmers linkage system in south western Nigeria. Unpublished Ph. D. Thesis in the Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan. 141pp.
- Ovwigbo, B. O. (2015). Role perception and performance of agricultural extension agents in maize marketing in Delta State, Nigeria. *Journal of Biology, Agriculture and Healthcare* 5(15): 7-13.
- Pallant, J. (2011). Survival manual. *A step by step guide to data analysis using SPSS*.
- Pangani, M. D. (2007). Perceptions of small holders on the effectiveness of female and male agriculture and livestock extension field officers based on the Akap sequence: A case study of Mvomero district. Doctoral dissertation, MSc. Dissertation for Degree Award in Agriculture Economics at Morogoro: Sokoine University of Agriculture. 98pp.
- Petrovic, Z., Jankovic, D. and Jovana, C. (2008). Empirical survey. The role of agricultural stations in agricultural extension in Serbia.
- Raison, B. (2010). Educators or Facilitators? Clarifying Extension's Role in the Emerging Local Food Systems Movement. [<https://joe.org/joe/2010june/comm1.php>] site visited on 21st August 2019.
- Ramorathudi, M. V. and Terblanche, S. E. (2018). Identification of factors that influence the performance of extension management systems in Kweneng and Southern Districts of Botswana. *South African Journal of Agricultural Extension* 46(2): 69-78.

- Ragasa, C., Ulimwengu, J., Randriamamonjy, J. and Budibonga, T. (2013). Assessment of the Capacity, Incentives and Performance of Agricultural Extension Agents in Western Democratic Republic Congo.
- Rutatora, D. F. and Mattee, A. Z. (2001). Major agricultural extension providers in Tanzania. *African Study Monographs* 22(4): 155-173.
- Sanga, C., Mlozi, M. R. S., Tumbo, S., Mussa, M., Sheto, M. C. R., Mwamkinga, G. H. and Haug, R. (2013). On search for strategies to increase the coverage of agricultural extension services: Web based farmers' advisory information system of Sokoine University of Agriculture and MAFC Dar es Salaam, MATI Uyole and Norwegian University of life. *Journal of International Computing and ICT Research* 7(1): 42 – 55.
- Saleh, J. M., Man, N., Salih, M. H., Hassan, S., Nawi, N. M., and Mohammed, S. J. (2016). Training needs of agriculture extension officers in Iraq. *International Journal of Scientific and Research Publications* 6(2): 147-152.
- Sani, L., Boadi, B. Y., Oladokun, O. and Kalusopa, T. (2014). The generation and dissemination of agricultural information to farmers in Nigeria: A review. *Journal of Agriculture and Veterinary Science* 7(2): 102-111.
- Simelane, S. M., Terblanche, S. E. and Masarirambi, M. T. (2019). Perceptions of extension officers regarding public extension services: a case study of horticultural extension officers in the Hhohho region, Eswatini. *South African Journal of Agricultural Extension* 47(1): 1-19.
- Suvedi, B. M. and Kaplowitz, M. (2016). What every extension worker should know – core competency handbook. Department of community sustainability Michigan

State University, USA. 193pp.

Shah, D., Ali, G., S.M.A. Jan, A. Jan, M. Fayaz, I. Ullah and M.Z. Khan (2013). Technical Efficiency of Sugarcane Production in District Dera Ismail Khan. *Sarhad Journal of Agriculture* 29(4): 585-590.

Stefanis, C. (2014). Global Food Security: An Agricultural Perspective. *Journal of Agriculture and Sustainability* 6(1).

Stevens, J. B. and van Heerden, P. S. (2016). Knowledge brokering and dissemination of irrigation management guidelines for training of extension advisors. *Report No. KV, 356, 16.*

Stock, J. (2015). Agricultural Extension Officer [<https://commonwealth.gostudy.net/occupation/agricultural-extension-officer>] site visited on 31st August 2019.

Swanson, B. E. (2008). *Global review of good agricultural extension and advisory service practices*. Rome: Food and Agriculture Organization of the United Nations.

Takemura, K., Yukiko, U. and Sakiko, Y. (2014). Roles of extension officers to promote social capital in Japanese agricultural communities.

URT, United Republic of Tanzania (2013). *The National Agricultural Policy (Final draft)*, United Republic of Tanzania; Dares Salaam.

URT, United Republic of Tanzania (2011). *Scheme of service for Local Government Authorities*. (Compiled version from 2002-2011). Public Service Management Library.

URT, United Republic of Tanzania (2015). *Agricultural Sector Development Strategy - II 2015/2016 – 2024/2025*.

- Uzuegbu, C. P. and Nnadozie, C. O. (2015). Henry Fayol's 14 Principles of Management: Implications for Libraries and Information Centres. *Journal of Information Science theory and practice* 3(2): 58-72
- Van den Ban, A. W., and Hawkins, H. S. (1996). *Agricultural Extension*. Blackwell Science LTD. 36pp.
- Vough, H. C., Cardador, M. T., Bednar, J. S., Dane, E., and Pratt, M. G. (2013). What clients don't get about my profession: A model of perceived role-based image discrepancies. *Academy of Management Journal* 56(4): 1050-1080.
- Wooldridge, J. (2008). *Introductory Econometrics: A Modern Approach* (4th ed.). Florence, KY: Cengage Learning Services. 75pp
- Zelalem, B. (2011). Factors influencing work motivation of development agents, Assosa Zone, Benishangul Gumuz Regional State, Ethiopia. MSc. Thesis for Award Degree at Haramaya University. 125pp.
- Zikhali, Z. M. (2016). Meeting the extension needs of smallholder farmers: the climate information gap in the public agricultural extension and advisory services in Limpopo, South Africa. Doctoral Dissertation for Award Degree at University of Kwazulu-Natal. 123pp.

APPENDICES

Appendix 1: Questionnaire

INTRODUCTION

Zahara Hassan Mkuki is a postgraduate student at Sokoine University of Agriculture, currently, she is undertaking a study **titled Assessment Of Agricultural Extension Officers' perceptions on their roles**. You are therefore requested to offer your strong cooperation in responding to this questionnaire. We strongly appeal to you that information given will only be used for the stated purpose and not otherwise; again it will be confidential.

Questionnaire for village and ward Agricultural Extension Officers (AEOs)

GENERAL INFORMATION

Questionnaire Number-----

Date.....

District.....Ward.....Village.....

SECTION A.

1. Name of respondent (Optional).....Phone number -----

2. What is your age? (in years)-----

3. Sex (Please tick (√): 1. Mal 2. Female

4. What is your highest educational qualification? (Please tick (√))

Certificate 1

Diploma 2

Degree 3

Masters 4

Others, specify 5.....

5. Current designation: (Please tick (√))

Ward Agricultural Extension Officer (WAEO) 1

Village Agricultural Extension Officer (VAEO) 2

6. Area of specialization (Please tick (√))

Crop Production 1

Livestock Production 2

Agricultural Extension 3

General Agriculture 4
 Others, please specify 5-----

7. Work experience (in years)-----

SECTION B.

Objective 1. To identify roles performed by extension officers.

8. Please you are requested to tick against each statement according to the frequent of involvement in each roles; 1= Very Frequently (VF); 2= Frequently (F); 3=Not Much (NM); 4=Rarely (R) 5=Very Rarely (VR).

S/N	STATEMENTS	Level of role performance				
		VF	F	NM	R	VR
9.1	Educate farmers on the best use of pesticides and fertilizers					
9.2	Dissemination of new research findings					
9.3	Identify and conserve water catchment areas					
9.4	Maintain productive plants/trees					
9.5	Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting Etc					
9.6	Manage the daily activities of agricultural experiments					
9.7	Control plants and crops pests					
9.8	Organize farmers' meetings for identifying problems and setting priorities					
9.9	Participate in agricultural research					
9.10	Provide nutritional training to farmers					
9.11	Advice farmers groups in making better decisions to increase agricultural production					
9.12	Testing of seed moisture content					
9.13	Facilitate group formation					
9.14	Provide advice to farmers on diversified agriculture					
9.15	Collect and keep records of crop production per week, month and year					
9.16	Link farmers with research centres					
9.17	Plan on land use (e.g. land for livestock, crop production, etc)					
9.18	Collect and keep rainfall data					

8						
9.1 9	Identify and supervise input suppliers					
9.2 0	Facilitating farmers access to credit					
9.2 1	Participate in evaluating crop production estimates for setting up future production plans					
9.2 2	Facilitating farmers access to input supply					
9.2 3	Planning extension programme (e.g. develop a work plan, budget etc)					
9.2 4	Testing seed quality					
9.2 5	Collect and keep crop prices per week, month and year					
9.2 6	Educate farmers on proper use of soil and water					
9.2 7	Facilitating farmers access to market					
9.2 8	Cooperate with researchers to conduct experimental plots					
9.2 9	Testing of seed germination					
9.3 0	Provide professional skills in production of vegetables, fruits, flowers and spices					
9.3 1	Collect and keep experimental plot data					
9.3 2	Collecting levies and taxes in the area					
9.3 3	Coordinating and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)					
9.3 4	Working as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)					
9.3 5	Undertaking entrepreneurial activities					
9.3 6	Conducting evaluation of buildings, roads and other infrastructure and tree plantations in the area					
	Other roles, please specify					

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Objective 2. To determine agricultural extension officers' awareness of their roles

9. Please, tick (✓) to the box whether you strongly agree (5), agree (4), Undecided (3), disagree (2), strongly disagree (1) with the following statements in regard to roles of AEOs

	STATEMENTS	MEASUREMENTS				
		Strongly agree (5)	Agree (4)	Undecided (3)	Dis agree (2)	Strongly Disagree (1)
10.1	Role of AEOs is to educate farmers on the best use of pesticides and fertilizers					
10.2	Role of AEOs is to disseminate new research findings					
10.3	Role of AEOs is to identify and conserve water catchment areas					
10.4	Role of AEOs is to maintain productive plants/trees					
10.5	Role of AEOs is to educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc)					
10.6	Role of AEOs is to manage the daily activities of agricultural experiments					
10.7	Role of AEOs is to control plants and crops pests					
10.8	Role of AEOs is to Organize farmers' meetings for identifying problems and setting priorities					
10.9	Role of AEOs is to participate in agricultural research					
10.10	Role of AEOs is to provide nutritional training to farmers					
10.11	Role of AEOs is to advice farmers groups in making better decisions to increase agricultural production					
10.12	Role of AEOs is to test moisture content					
10.13	Role of AEOs is to facilitate group formation					
10.14	Role of AEOs is to provide advice to farmers on diversified agriculture					
10.15	Role of AEOs is to collect and keep records of crop production per week, month and year					
10.16	Role of AEOs is to link farmers with research centres					
10.17	Role of AEOs is to plan on land use (e.g. land					

	for livestock, crop production, etc					
10.18	Role of AEOs is to test seed quality					
10.19	Role of AEOs is to collect and keep rainfall data					
10.20	Role of AEOs is to identify and supervise input suppliers					
10.21	Role of AEOs is to facilitate farmers access to credit					
10.22	Role of AEOs is to participate in evaluating crop production estimates for setting up future production plans					
10.22	Role of AEOs is to facilitate farmers access to input supply					
10.23	Role of AEOs is to Plan extension programme					
10.24	Role of AEOs is to Collect and keep crop prices per week, month and year					
10.25	Role of AEOs is to educate farmers on proper use of soil and water					
10.26	Role of AEOs is to facilitate farmers access to market					
10.27	Role of AEOs is to cooperate with researchers to conduct experimental plots					
10.29	Role of AEOs is to test seed germination					
10.30	Role of AEOs is to provide professional skills in production of vegetables, fruits, flowers and spices					
10.31	Role of AEOs is to collect and keep experimental data					
10.32	Role of AEOs to collect levies and taxes in the area					
10.33	Role of AEOs is to coordinate and supervise different programmes (e.g. Tanzania Social Action Fund -TASAF)					
10.34	Role of AEOs is to work as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)					
10.35	Role of AEOs is to undertake entrepreneurial activities					
10.36	Role of AEOs to conduct evaluation of buildings, roads and other infrastructure and tree plantations in the area					

Objective 3. To determine Agricultural Extension Officers' self-assessment of their competence in performing their roles

10. Please, indicate by a tick (√) the box that corresponds to your **perceived level of competence**; Not competent (1), Low competence (2), Average competence (3), Highly competent (4), Very highly competent (5) in each of the following statements

	STATEMENTS	MEASUREMENT				
		NC	LC	AC	HC	VHC
11.1	Educate farmers on the best use of pesticides and fertilizers					
11.2	Dissemination of new research findings					
11.3	Identify and conserve water catchment areas					
11.4	Maintain productive plants/trees					
11.5	Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc					
11.6	Manage the daily activities of agricultural experiments					
11.7	Organize farmers' meetings for identifying problems and setting priorities					
11.8	Participate in agricultural research					
11.9	Provide nutritional training					
11.10	Advice farmers groups in making better decisions to increase agricultural production					
11.11	Testing seed quality					
11.12	Facilitate group formation					
11.13	Provide advice to farmers on diversified agriculture					
11.14	Collect and keep records of crop production per week, month and year					
11.15	Link farmers with research centre					
11.16	Collect and keep rainfall data					
11.17	Identify and supervise input suppliers					
11.18	Facilitating farmers access to credit					
11.19	Participate in evaluating crop production estimates for setting up future production plans					
11.20	Facilitating farmers access to input supply					
11.21	Planning extension programme					

	(e.g. develop a work plan, budget et)					
11.22	Collect and keep crop prices per week, month and year					
11.23	Educate farmers on proper use of soil and water					
11.24	Facilitating farmers access to market					
11.25	Cooperate with researchers to conduct experimental plots					
11.26	Testing seed germination					
11.27	Provide professional skills in production of vegetables, fruits, flowers and spices					
11.28	Testing seed moisture content					
11.29	Collect and keep experimental data					
11.30	farmers Control plants and crops pests					
11.31	Plan on land use (e.g. land for livestock, crop production, etc					
11.32	Collecting levies and taxes in the area					
11.33	Coordinating and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)					
11.34	Working as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)					
11.35	Undertaking entrepreneurial activities					
11.36	Conducting evaluation of buildings, roads and other infrastructure and tree plantations in the area					

Objective 4. To evaluate the opinions of agricultural extension officers in relation to their roles

11. Listed below are some role items delineating the job responsibilities in your position. You are requested to tick the most appropriate category against each statement according to the extent of perceived importance.

1= Most Important (MI), 2=Important (I), 3= Somewhat Important (SI), 4=Less Important(LI) 5= Not Important(NI)

S/N	Role Category	Level of importance				
		MI	I	SI	LM	NI
	Facilitation					
12.1	Facilitate group formation					
12.2	Facilitating farmers access to credit					
12.3	Facilitating farmers access to input supply					
12.4	Facilitating farmers access to market					
	Organization					
12.5	Planning on proper land use (e.g. land for livestock, crop production, etc)					
12.6	Development of extension programme (e.g. develop a work plan, budget etc)					
12.7	Participating in evaluating crop production estimates for setting up future production plans					
12.8	Organizing farmers' meetings for identifying problems and setting priorities					
	Intermediation					
12.9	Linking farmers with research centres					
12.10	Cooperating with researchers to conduct experiments					
12.11	Linking farmers with other service providers					
	Educational					
12.12	Educating farmers on proper use of soil and water					
12.13	Educating farmers on the best use of agro-inputs					
12.14	Educating farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc)					
12.15	Educate farmers on proper dietary practices for improved nutrition					
	Advisory					
12.16	Advising farmers' groups on making better decisions to increase agricultural production					
12.17	Advising farmers on how to practice diversified agriculture					
	Technical					

12.18	Testing of seed moisture content					
12.19	Testing of seed quality					
12.20	Testing of seed germination					
12.21	Maintaining productive plants/trees					
12.222	Managing the daily activities in agricultural experiments					
12.23	Controlling plants and crops pests					
12.24	Collecting and keeping records of crop production per week, month and year					
12.25	Collecting and keeping rainfall data in an area					
12.26	Supervising agro-input suppliers					
12.27	Collecting and keeping crop prices per week, month and year					
12.28	Collecting and keeping experimental data					
12.29	Disseminating new research findings to farmers					
12.30	Participating in agricultural research					
12.31	Knowing and evaluating water sources for conservation					
	Administrative					
12.32	Collecting levies and taxes in the area					
12.333	Coordinating and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)					
12.34	Working as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)					
12.35	Undertaking entrepreneurial activities					
12.36	Conducting evaluation of buildings, roads and other infrastructure and tree plantations in the area					

Generally how do you perceive extension work (role)? (Please tick (√) from 5 = strongly Agree to 1=strongly Dis Agree

	Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)
13.1	Overload with non-extension tasks					
13.2	Lack of adequate management					
13.3	Shortage of AEOs which leads to many farmers to handle					
13.4	Lack in-service training					

13.5	Inadequate logistics and other supports for AEOs					
13.6	Disappointing due to farmers' lack or shortage of working capital					
13.7	Poor perception towards extension work					

Objective 5. Factors influencing AEOs perceptions of their roles.

Professional training and level of supervision

12. Have you ever attended any in-service course since you completed your pre-service training?

Yes No

If yes, please indicate the course, duration, place and content of in-service training you have attended during the last five (5) years (from July 2013 to July 2018)

S/N	Name of the course	Duration (in weeks)	Date (year)	Place	Major theme /content
1					
2					
3					

13. Do you have someone to supervise you on a regular basis?

1. Yes 2. No

14. If yes, what is the mode of supervision? (Please tick (√))

- 1. He/she visit me at my working station
- 2. I meet with him or her at district headquarter
- 3. I just prepare my report and send it to him/her
- 4. Any other mode, Please specify

.....

15. What is the frequency of supervision in a month?times.

16. Do you know the schedule of activities of your supervisors? (Please tick (√))

17. 1. Yes 2. No

Transport, working distance and motivation

18. Do you have transport to use in performing your roles as an AEO?

1. Yes [] 2. No []

19. If yes, what type of transport do you use? (Please tick (√))

- 1. Motorbike []
- 2. Bicycle []

20. If no, which means of transport do you use frequently (Please tick (√))

1. Walking on foot []

2. Public transport []

3. Others, please specify.....

21. Choose from the suggested list below your level of agreement or disagreement, how each of the following factors motivates you as an Agricultural Extension Officer. (Please tick (√) from 5 = Strongly Agree (SA to 1=Strongly Dis Agree (SD)

	Factors	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	(1) Strongly Disagree
25. 1	Nature of work					
25. 2	Promotion in an organization					
25. 3	Responsibility (Authority to make necessary decision in order to complete assigned work)					
25. 4	Appreciation for work					
25. 5	Salary					
25. 6	Working condition					
25. 7	Relationship with supervisor					
25. 8	Relationship with peer					
	Others, please specify					

Appendix 2: Check-list for Focus Group Discussion (FGD)

FGD check-list questions for Agricultural Officers (AOs) and District Agricultural Irrigation and Cooperative Officers (DAICOs) at district level.

1. What roles AEOs currently perform in their work place?

	STATEMENTS	NO (1)	YES (2)
1.1	Educate farmers on the best use of pesticides and fertilizers		
1.2	Dissemination of new research findings		
1.3	Identify and conserve water catchment areas		
1.4	Maintain productive plants/trees		
1.5	Educate farmers on the best agricultural practices (e.g. land preparation, spacing, weeding, harvesting etc		
1.6	Manage the daily activities of agricultural experiments		
1.7	Control plants and crops pests		
1.8	Organize farmers' meetings for identifying problems and setting priorities		
1.9	Participate in agricultural researches		
1.10	Provide nutritional training to farmers		
1.11	Advise farmers groups in making better decisions to increase agricultural production		
1.12	Testing seed moisture content		
1.13	Facilitate group formation		
1.14	Provide advice to farmers on diversified agriculture		
1.15	Collect and keep records of crop production per week, month and year		
1.16	Link farmers with research centre		
1.17	Plan on land use (e.g. land for livestock, crop production, etc		
1.18	Collect and keep rainfall data		
1.19	Identify and supervise input suppliers		
1.20	Facilitating farmers access to credit		
1.21	Participate in evaluating crop production estimates for setting up future production plans		
1.22	Facilitating farmers access to input supply		

2			
1.2 3	Planning extension programme (e.g. develop a work plan, budget etc)		
1.2 4	Testing seed quality		
1.2 5	Collect and keep crop prices per week, month and year		
1.2 6	Educate farmers on proper use of soil and water		
1.2 7	Facilitating farmers access to market		
1.2 8	Cooperate with researchers to conduct experimental plots		
1.2 9	Testing seed germination		
1.3 0	Provide professional skills in production of vegetables, fruits, flowers and spices		
1.3 1	Collect and keep experimental data		
1.3 2	Collecting levies and taxes in the area		
1.3 3	Coordinating and supervising different programmes (e.g. Tanzania Social Action Fund -TASAF)		
1.3 4	Working as a leader (e.g. Ward or Village Executive Officer- WEO or VEO)		
1.3 5	Undertaking entrepreneurial activities		
1.3 6	Conducting evaluation of buildings, roads and other infrastructure and tree plantations in the area		
	Other roles..		

2. In your opinion, generally what do you say about the roles AEOs

3. How do you supervise your AEOs?

4. What are the factors that influence AEOs perceptions of their roles