ASSESSMENT OF EFFECTIVENESS OF TEACHING AGRICULTURAL PROGRAMME TO ADULT LEARNERS IN THE SELECTED CENTRES IN TUNDURU DISTRICT, TANZANIA

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ABSTRACT

The study on assessment of the effectiveness of teaching agricultural programme to adult learners in selected centres through Integrated Community Based Adult Education (ICBAE) was carried out in Tunduru district council in Tanzania. Specifically, the study sought to determine socio-economic factors of the adult learners in adult education centres and teachers' characteristics; assessing knowledge of the agricultural programme in adult education centres; to assess application of recommended basic practices of agricultural programme and to determine the perception of adult learners on the effectiveness of the teaching agricultural programme to improve learners' livelihood. The study comprised a sample of 244 adult learners who were randomly selected by using electronic number generator technique. Primary data were obtained using questionnaire, focus group discussion, key informant interviews and observation of any agricultural programme conducted in the study area. Quantitative and qualitative data were analysed using Software Package for Social Sciences (SPSS) and content analysis respectively. The study found that teaching agricultural programme in the selected adult centres in ICBAE was not effective. This is because of the fact that only one adult education centre out of 11 adult centres teaches the agricultural programme. This study recommends that the Tunduru District Council should equip adult centres with teachers and other teaching resources, for smooth running of the agricultural programmes and set adequate funds to improve the availability and accessibility of agricultural programme.

DECLARATION

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

_____ _____

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The above declaration confirmed by

_____ _____

Dr. Innocent Mathias Busindeli Date

(Supervisor)

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DEDICATION

I dedicate this work to Malibiche family for their encouragement and constant support in laying down the foundation for my education.

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LIST OF ABREVIATIONS AND ACRONYMS

CBO	Community Based Organisation
DC	District Council
DEAO	District Education and Agricultural Officer
EFA	Education for All
ESR	Education for Self- Reliance
FGD	Focus Group Discussion
ICBAE	Integrated Community Based Adult Education
KII	Key Informant Interview
LEM	Logic Education Model
MC	Municipal Council
MoEST	Ministry of Education, Science and Technology
NGOs	Non-Government Organisation
RAS	Regional Administrative Secretary
REFLECT	Regenerated Freire Literacy through Empowering Community Technique
SPSS	Software Package for Social Science
SRS	Simple Random Sampling
TTC	Teachers Training College
UNESCO	United Nations Educational, Scientific and Cultural Organisation
URT	United Republic of Tanzania
VEC	Vocational Education Committee
WARCs	Ward Agricultural Resource Centres
WEO	Ward Education Officer

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The national development agenda in Tanzania as envisaged in Tanzania development vision 2025 (URT, 1999) has focused on socio-economic growth and poverty reduction. One of the main objectives of the National development vision was to create a well-educated learning society. In realising this objective, Tanzania established various education programmes and strategies intended to contribute to meeting the Education for All (EFA) goal, which focuses on equitable education including adult education (URT, 2015). The adult education programmes aimed at self-reliance and improvement of individuals' livelihood at and national level through various education programmes and strategies (Mwaikokesya and Mushi, 2017). In Tanzania since independence to date (2018) various education programmes have been implemented. These include Education for Self Reliance (ESR), Complementary Basic Education for Tanzania (COBET) and Open and Distance Learning (OLD) (URT, 2015). However, this adult education programme had top-down approaches, teacher-centred methodologies and fixed curriculum, hence not relevant to learners' needs (UNESCO, 2014).

Integrated Community Based Adult Education (ICBAE) programme was launched in 1993 to implement education for All (EFA) objectives. The ICBAE programme was designed to develop learner-centred and community–based learning approaches such as agricultural programme, literacy and post literacy classes for adults. According to Mushi (2009) the programme had a positive outcome. For example, the literacy rate increased to 13 per cent in 2009. The programme operates across Tanzania including Tunduru district. The programme uses primary schools as learning centres and facilitated by primary

teachers (Batwa and Kamwela, 2010). The programme is flexible based on communities' environment and topics taught include agriculture and micro-economics, health and hygiene and social-politics (Batwa and Kamwela, 2010). The agricultural programme (agricultural and micro-economics) includes crop production, livestock keeping, environmental conservation, micro-economics and natural resources.

Rationale for establishment of agricultural programme to adult learners has been designed to provide access to quality knowledge and skills for food security and income generation. The ICBAE programme has four core principles namely empowerment, participation, ownership and sustainability (EPOS). The curriculum has been designed recognizing the need of the individuals and community around. The community was enhanced to make decisions on what to do, how to do it, why and when to do it for their own benefit though income generation programmes (URT, 1995; Batwa and Kamwela, 2010; Suvedi and Kaplowitz, 2016). Therefore the ICBAE envisage that the adult learners involved in the programme imparted programme principles.

Agricultural technologies and techniques are constantly changing; adult learners need to know how to use agricultural innovations for the exploitation of the inherent yield potentials (Suvedi and Kaplowitz, 2016). It is, therefore, a mandate and responsibility of teachers of adult centres to teach agricultural programme to adult learners. This is because blanket recommendations in teaching agricultural programme in adult centres resulted in farmers continuing using inappropriate technologies. This study, therefore, intended to assess the effectiveness of teaching agricultural programme to adult learners in selected centres through ICBAE for increased agricultural production. Particularly, paying attention to candidates involved in ICBAE in Tunduru district.

1.2 Problem Statement

Statistics indicate that Tunduru district has 1,268 teachers of various qualifications to serve 149 primary schools as the centres of adult learning. However, there were 87 adults' centres providing Intergraded Community Based Adult Education (ICBAE) out of 149 adult education centres with 1,430 adult learners (TDC strategic plan report, 2015). Still, there is a general mixed perception by adult learners, government officials and the public on whether or not teaching agricultural programme has brought intended results. This shows that there is a lack of understanding of the effectiveness of teaching agricultural programme (Batwa and Kamwela, 2010; Nkunguu, 2014; Kway, 2016). A study intended to assess effectiveness in teaching integrated community based adult education, particularly the agricultural programme in selected adult centres.

1.3 Justification

Adult education in Tanzania has been emphasised during post- independence and was reinforced during the Dar es Salaam Declaration (Nyerere, 1968). Over time, the Government has devised a mechanism to support adult education such as provision of primary school teachers as facilitators of the adult education programme (URT, 1995; URT, 2014). Despite the work done on Integrated Community Basic Adult Education (ICBAE), studies on the effectiveness of teaching agricultural programme in adult education centres in Tunduru on crop production, livestock keeping, environmental conservation, micro-economics and natural resources are limited. Therefore, this study, expected to generate findings that would shed light on the effectiveness of teaching agricultural programme in adult education centres to extent that can assist programme planners in planning agricultural projects and community research.

1.4 Objectives

1.4.1 Overall objective

To assess the effectiveness of teaching agricultural programme to adult learners in Tunduru District.

1.4.2 Specific objectives

Specifically, the study sought: -

i. To asses socio-economic factors of adult learners and teachers' characteristics in selected adult education centres
ii. To assess adult learners' knowledge levels of the agricultural programme in selected adult learners education centres
iii. To assess the extent to which recommended basic practices of agricultural programme in selected education centres are applied
iv. To assess the perception of adult learners on effectiveness of teaching agricultural programme

1.5 Research Questions

i. What are adults' socio-economic factors and teachers' characteristics that influence the achievement of agricultural programme objectives in selected adult education centres?
ii. What types of agricultural programming knowledge accessed from adult education selected centres?
iii. What are basic practices acquired in adult education selected centres?
iv. To what extent are acquired agricultural techniques practiced by adults in their household?
v. What is the perception of adult learners on effectiveness of teachers in teaching agricultural programme?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This part of the study presents about the effectiveness of teaching agricultural programme in adult education centres. The chapter contains reviews of literature on socio-economic factors of adult learners and empirical reviews. Lastly, the chapter presents the theoretical and conceptual frameworks and definitions of key terms.

2.2 Concept of Effectiveness

Effectiveness refers to the extent to which stated objectives are met or achieved. The effectiveness of a programme is measured by the output of a programme. That is, how the programme achieves the stated objectives (desired outcome) of that programme. There is a general agreement among different authors that the term effectiveness is difficult to measure as the concept itself is complex (Kyaruzi, 2008). AGPC (2013) asserts that programme effectiveness and performance indicators are based on an agreed measure of access, appropriateness and quality. Indicators aim to reflect the extent to which the objectives of any programme were achieved (AGPC, 2013; Yauleni, 2008). In this study, effectiveness refers to the ability and commitment of adult learners to achieve the stated learning objectives and vivid output of the agricultural programme which has been trained through Logic Education Model (LEM). Effectiveness, therefore, is conceptualised as the ability of adult learners in acquiring modern agricultural knowledge and application of improved technologies and techniques for increased agricultural production as a result of teaching process. Therefore, the effectiveness of teaching agricultural programme should be measured through adult learners' capacity to understand and apply recommended key practices of agricultural programme.

2.3 Socio-economic Factors of Adult Learners

In this study, socio-economic factors were as described below.

2.3.1 Age of learners in influencing learning in adult education centres

The influence of adult learners' age has been explained differently by different researchers. Some researchers explained that age has a positive influence, particularly in agricultural production that most adult learners need adult learning skills to solve their existing agricultural problems. This is because they have accumulated capital and experiences to access to credit rather than youth (Dollisso and Martin, 1999; Ndlovu and Moyo, 2013). There is a need for a study to find out the influence of age in learning agricultural programme in adult education centres.

2.3.2 The influence of marital status on learning agricultural programme in adult centres

Marital status of the learners is the factor in determining the overall outcome of the current adult education programme. The study shows that single or delayed marriage increases education attainment (Seyoum and Amdemekel, 2016). Furthermore, Ndlovu and Moyo (2013) observed that unmarried adults have higher ability in adult education in terms of performance followed by divorced and married adults. There is limited literature on how marital status influences adult learners in learning agricultural programme within Tunduru District.

2.3.3 Learners' education levels

The learners' education level has a positive influence in attainment and involvement in the education process. Studies show that the higher education level of the learner, the higher they left an agricultural career as they view that farming is an occupation of last

resort (Njenga *et al*., 2012; Robison-pant, 2016). The study by UNESCO (2014) cites evidence that educated farmers were more likely to make better use of technologies; for instance, irrigation in China and increased fertilizer use in Ethiopia. It is also challenging to know about how learners access to learning agricultural programme. This is because literature does not give straight answer (UNESCO, 2014a; Njenga *et al.*, 2012; Robison-pant, 2016).

2.3.4 Sex of learners in adult centres in learning agricultural programme

Being a male and female adult learner has a higher influence on learning, adult education programme including agriculture (Abah and Petja, 2015). However, study by Kageni (2012), on factors influencing participation in adult learning showed that females have a positive engagement with the adult education programmes. The contradiction in the literature calls for more research on how sex influence learners in adult education centre learning agricultural programme.

2.3.5 Income of adult learners

The main source of income for most community members is subsistence agriculture in sub-Saharan countries (Shaleyo, 2012). Families with more income are better able to purchase agricultural inputs necessary for agricultural production, hence positively influencing the development of their children (Duncan and Magnuson, 2011; ETS, 2013). However, the study by Abah and Petja (2015) showed that the preponderance of adult learners has very little effect on income due to limitations in the application of acquired knowledge in agricultural production.

2.3.6 Learners' occupation

Most adult learners are in rural areas and depend on subsistence farming. Therefore, household head inspire their children to agriculture as a career (Dlamini and Keregero, 2002; Nzigula, 2015). It is not clear on how adults utilise modern skills acquired in the agricultural programme to engage in agricultural production and value addition activities in their communities.

2.4 Empirical Review

2.4.1 Understanding knowledge of agricultural programme in adults centres

Ministry of Education, Science and Technology (MoEST) has adopted Regenerated Freire Literacy through Empowering Community Technique (REFLECT) development (Batwa and Kamwela, 2010). The methodology was developed through field practical, where learners critically analysed the environment, identified problems, discussed and came up with solutions for sustainable agricultural production and value addition. However, scholars recommend for adult teaching innovative methods (Modebelu and Duvie, 2012). In this view, effective method of teaching should be geared to practical oriented to develop learners' skills (Ahmad *et al*., 2014). Therefore, this question of whether adult educators use methods or not in their teaching agricultural programme in adult centres needs a response. There is a dearth of studies on this particular aspect. For instance, Nzingula (2015) studied factors that influenced contextualised teaching and learning in Mwanza City primary school using agricultural experience. The study of Tesha (2018) studied the effectiveness of teaching and learning agricultural science in selected secondary schools in Tanzania. However, both studies did not focus on the effectiveness of teaching agricultural programmes in adult education centres.

2.4.2 Application of agricultural knowledge by learners from adult education selected centres

Historically, agricultural primary and secondary schools, technical and vocational education and training have focused sharply on preparing candidates for on -farm and off farm employment, whereas post-secondary education on agriculture aimed to produce graduates to fill agricultural related public sector positions. A general assumption was that agriculture is only an economic activity viable in rural areas. Consequently, training at the primary, secondary and higher level needs to be production oriented (Acker and Gasperini, 2009). Incorporating agriculture into learning centres in rural areas seems quite logical from the perceptive of food security. School integrated agriculture in curricula and those that use school gardening as an experiential learning have a greater success in a few countries. For instance, in Paraguaya, the teacher teaches agricultural through theory and practical in school farms, and produce were used by learners in school diet and selling, hence learners learn how to save money, invest and earn money. In Nigeria, agriculture, science teachers are trained and groomed from the teacher preparation institution for quality impact of agricultural skills (Acker and Gasperini, 2009). In Tanzania, teaching agricultural programme is done through in-service training course for three (3) months in teachers' training colleges (TTC). In addition, one year course at Vikindu teachers' college to equip teachers with basic agricultural skills and then other higher learning institutions like Sokoine University of Agriculture.

2.4.3 Perception of adult learners on teaching agricultural programme

Learners' perception towards agriculture is not so positive even in rural areas (Hari *et al.,* 2013). This is due to unavailability of professional teachers for instance primary teachers who were trained in pedagogical methodologies are deployed to teach agriculture in adult centres that require andragogy techniques. In addition, insufficient

teaching and learning facilities, some optional subjects like agriculture are offered to a very small scale within a limited number of schools (Martin and Omer, 1990). Effective teaching and learning is imperative for attainment of classroom goal, educational goal and natural goal. To achieve that, teachers should be qualified and professional and learners should be highly motivated (Nkunguu, 2014). The learners' psychological tendency is expressed by individuals by evaluating a particular entity with some degree of favour or disfavour. The study wanted to understand how adult candidates feel about their teachers in delivering the agricultural programme.

2.5 Knowledge Gap from Literature

Literature review has shown that adult learners face constraints in pursuing agricultural programme in education institutions. Hence, the implementation of self-reliance as a focal point of agriculture to be taught in adult education centres to integrate theory with practical was limited. Therefore, this study assessed the effectiveness of teaching agricultural programme to candidates involved in Integrated Community Based Adult Education (ICBAE) programme.

2.6 Theoretical Framework

Education for self-reliance philosophy (ESR) was adopted (Nyerere, 1967). The philosophy focuses on the fact that learners have self-ability, commitment and effort to provide the spiritual and temporal necessities of life for self and family. The objective of ESR is to restructure the colonial education oriented system of education and make it relevant to the societal needs. This calls for learning by doing (Sanga, 2016; Ahamad *et al*., 2014). Another concept in this framework was the use of Logic Education Model (LEM), in which it tries to link logical adult education programme and critical measure of performance of individual actors in the model. It illustrates a sequence of

cause and effect relationship approach toward result desired. An element of the model is Input–Output-Outcome relationship. Within Input, one should invest knowledge based on agricultural programme. On the other hand, output is associated with agricultural programme and outcomes are short or long term impact of the programme (Lawton *et al*., 2014). In this study, the researcher focused on Input (knowledge provided by teachers and means used during teaching agricultural programmes) and output (actual practical performance of learners).

2.7 Conceptual Framework

Conceptual framework portrays the variables of the study and their relationships (Fig. 1). It was being built from Education for Self-reliance (ESR) (Nyerere, 1967) and Logic Education Model (Lawton *et al*., 2014). The theory and the model were relevant to this study because people were assumed to learn by doing the practice. “Self” in the education process denotes effective adult learners. Therefore, the study considered socio-economic factors of adult learners, understanding of knowledge, and application of recommended agricultural practices of the programme and perception of adult learners on effectiveness of teaching agricultural programme as independent variables. Therefore, the concept of effectiveness of teaching agricultural programme to adult learners as a dependent variable in this study was measured in terms of factors related to learners’ knowledge understanding, application of practices of agricultural programme. Learners’ perception was also considered to contribute to the effectiveness of the teaching agricultural programmes.

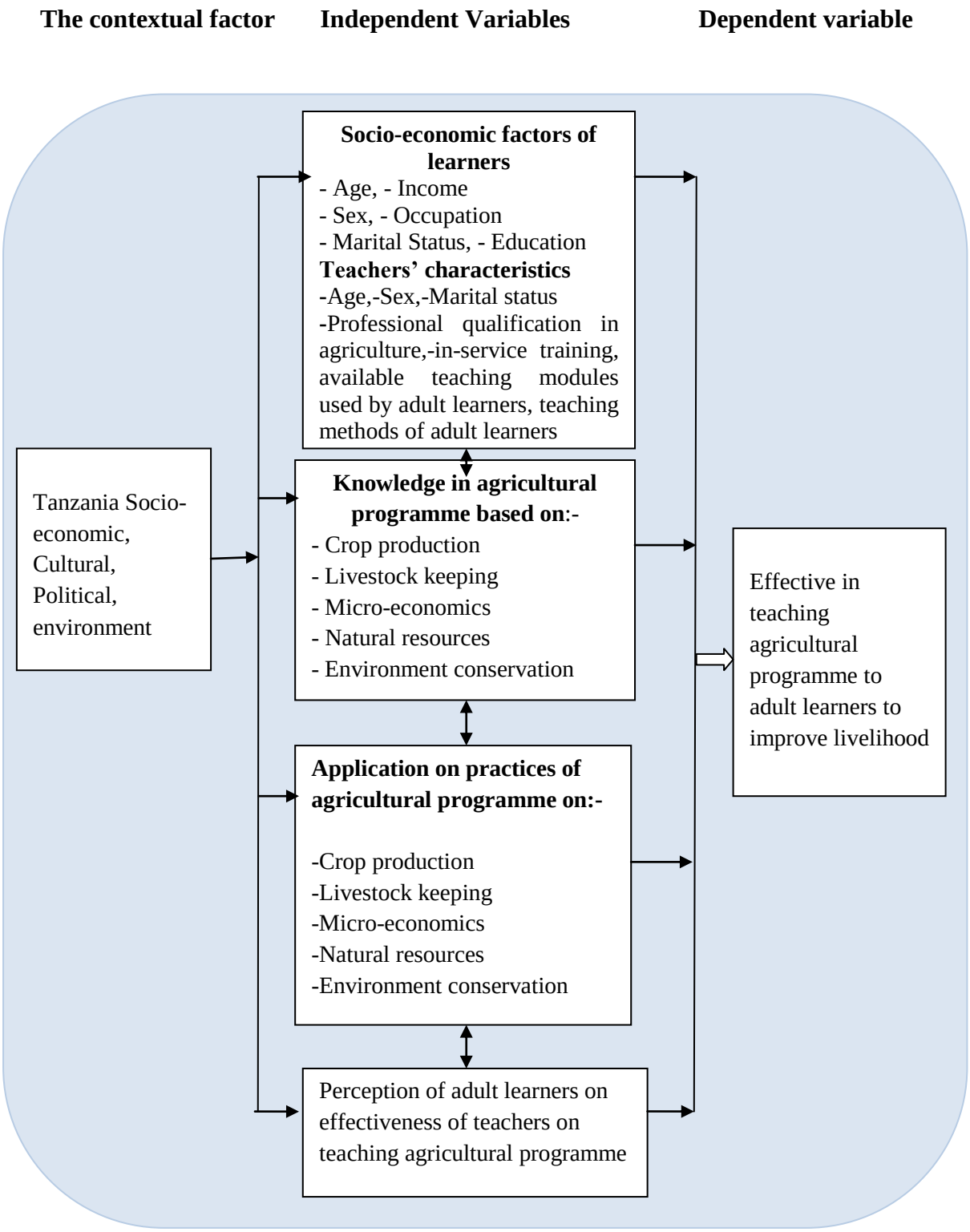

Figure 1: Effectiveness of teaching agricultural programme to adult learners in Tunduru District, Tanzania

2.8 Definitions of Key Terms

1. Adult learner: In this study was defined as any person above 18 years old with either formal or no formal education, but eligible to pursue adult education through Integrated Community Based Adult Education

2. Adult education centre: Is an education institution in an agreed area or building that hosts adult learners as per education policy of 1995 and 2014 respectively. In these centres primary teachers are facilitators of the teaching programme

3. Integrated Community Based Adult Education (ICBAE): In this study, it is defined as a programme aimed at adult learners. They learn about the programme from community for the sake of income generation from their education centres. It is based on adult learners' choice, knowledge and skills relevant to the acquisition of literacy, life and necessary vocational skills through Regenerated Freirean Literacy for Empowerment through Community Techniques (REFLECT) methodology.

4. Perception: means a psychological tendency. It is expressed by individuals by evaluating a particular entity with some degree of favour or disfavour. This helps understand how adult candidates feel about their teachers in delivering the agricultural programme. In this study, the perception was measured by five point scale on whether adult learners strongly agreed, agreed, undecided, disagreed or strongly disagreed that perceived message presentation by their teachers influenced the learners' application of acquired agricultural programmes in the adult centres for improved learners' livelihood.

5. Community: Is defined as a group of individuals with common or some common interest and stronger communication within or across the community boundary.

6. Teaching agricultural programme: mean the actions necessary to accomplish the goal and objectives of agricultural context. It involves clarity of teaching and learning goal to learners and strategies used in teaching (Tesha, 2018). In this study, it refers to provision of any agricultural activities designed by adult learners and their facilitator to meet intended learners' goals and objectives through theory and practical.

7. Effectiveness of teaching agricultural programme: In this study, it is the extent to which the predetermined results of teaching agricultural programme were met in terms of learners' use of agricultural knowledge and application of agricultural skills

8. Candidate: Persons above 18 years old and above registered as ICBAE members within the adult education centre.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Overview

This chapter describes methods and procedures used in the study. It describes the choice of study area, research design and sampling procedures. Finally, it presents the presentation of data collection and analysis methods.

3.2 Description of the Study Area

The research study was conducted in Tunduru District (Fig. 2). The District was purposively selected due to its potentiality in agricultural production and presence of adult education programmes. The study area faces challenges of having numbers of adult who were not engaging in a modern agricultural programme.

Tunduru District is one of the eight District Councils forming Ruvuma Region. It is located in the extreme South Eastern part of the Region between $10^0$15' and 11^0 45' south of the equator and between longitudes 36^0 30' and 38^0 east of Greenwich. It boarders Namtumbo District to the west, Liwale District to the north in Lindi region, Nachingwea District of Lindi region and the Masasi District in Mtwara region to the East. In the south borders the Ruvuma River, this forms a physical international boundary with the People's Republic of Mozambique.

Tunduru Township the administrative center of the District is situated 264 Km east of Songea and approximately 1264 Km from Dar es Salaam via Songea – Iringa – Morogoro Km. 800 via Lindi Region. The Tunduru District Council has a total land area of 18 778 square kilometres out of which 413 (2.2%) are covered with water bodies while land area is 18 365 (97.8%), square kilometres of these, 15,700 (83.6%) is arable land and 2,665 (14.2%) square kilometres are forest reserve.

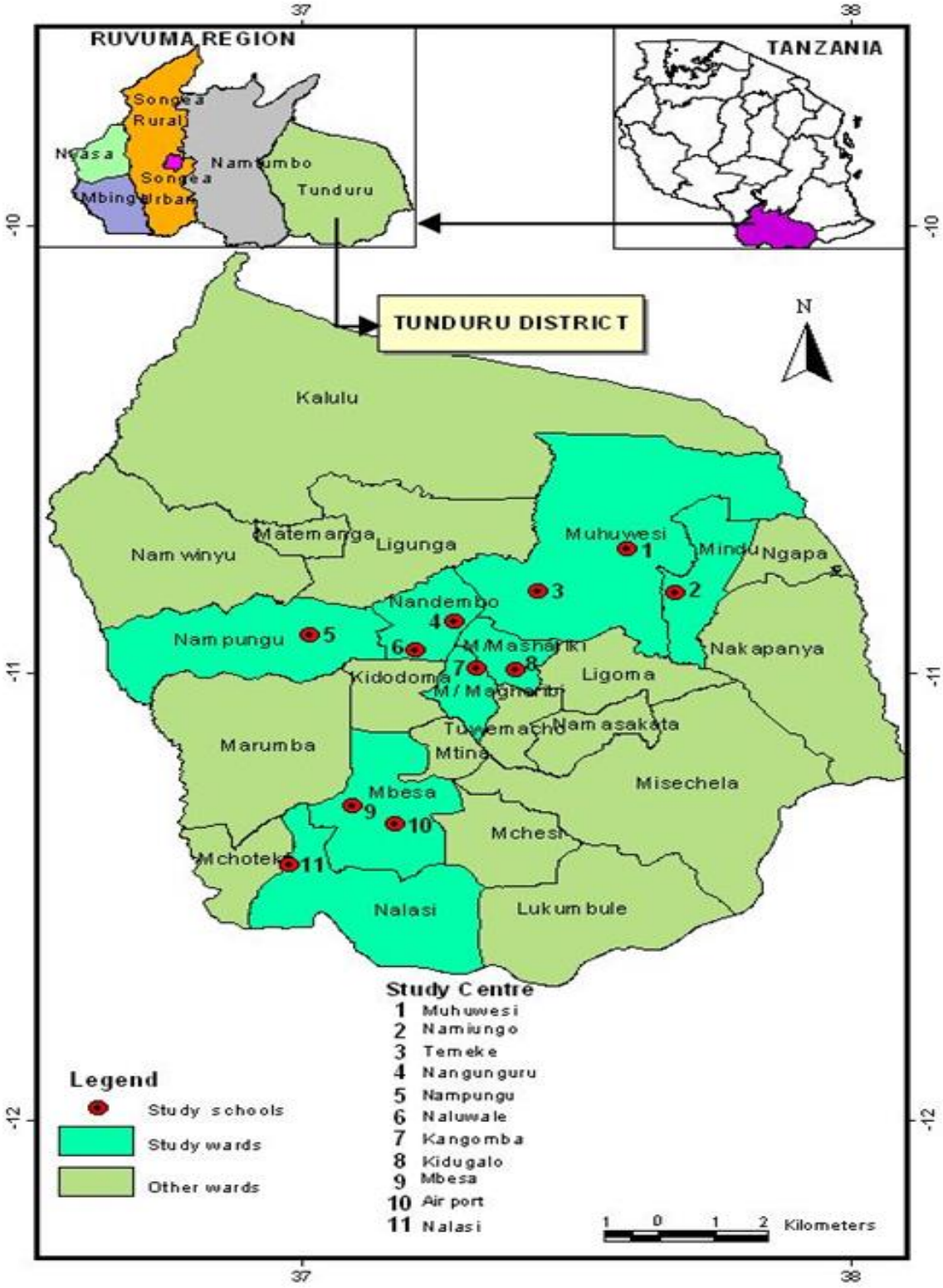

Figure 2: Location of Tunduru District

Climate (Rainfall pattern and temperature)

Tunduru forms part of the dry eastern zone of Ruvuma region. It is characterised by annual rainfalls less than 1000 mm on average per annum with rain season starting from December to May. Rainfall does reach its peak from January to March. The dry season starts from June to November, the temperature of the district varies from month to month, and the hottest month is November with the temperature reaching 36^0 degrees Celsius. The coldest months are in July and August when the temperature can drop to 10^0 degrees Celsius during the night (Tunduru District profile report, 2015).

Major occupation and economic activities

Most of the people in Tunduru District depend on small scale farming. Agriculture employs about 95 percent of the Community having 10-20 acres on average. The smaller number of the remaining population is businessmen and some practice small scale mining. Among the 15 700 sq. km (1 570 000 Ha.) of arable land, only 3000 sq. km (300 000 Ha.) is used for agriculture which is equal to 19.1 percent. Major food crops grown are cassava, paddy, maize and legume. Main cash crops grown are cashew nuts, ground nuts and tobacco, although Paddy and maize are now both Cash and Food crops. Livestock keeping is another economic activity taking place in Tunduru District. There are about 400 311 domesticated animals. Out of these 35 758 are Cattle, 43 413 are Goats, 7130 Sheep, 310 900 Chickens and 3110 Pigs (Tunduru District profile report, 2015).

It was estimated that about 95 percent of people in Tunduru engage in agricultural activities which was the main source of income with very little animal husbandry activities. The type of agriculture was still traditional (Shifting cultivation) with low yields per hectare. Individual peasants undertake farming for cash and food crop production. Cash crops are Tobacco, Cashew nuts, Sunflower, Simsim, Coconuts and Ground nuts. Whereas; Maize, Cassava,

Beans, Finger millets, Rice, Potatoes is food crops. However; nowadays Maize, Rice and Beans are becoming both food and cash crops. According to the Regional statistics of 2005/2006 the per capita income of people in Tunduru District is Tsh. 462 000.00 per annum. According to the 2012 National population census, the District had a total population of 298 279 whereby males were 143 660 and females were 154 619. The District has 70 142 households with a population growth rate of 2.7 percent per annum. The population projection for 2014 is 314 602 whereas Male was 151 522 and female was 163 080 (Tunduru District profile report, 2015). The study was carried out in eleven (11) adult education centres namely Airport, Kangomba, Kidugalo, Mbesa, Muhuwesi, Nalasi, Naluwale, Namiungo, Nampungu, Nangungulu and Temeke

3.3 Research Design

A cross-sectional research design was adopted for the study. The design allowed researchers to collect data at a single point in time from the sample to represent the population. Cross-section design allowed the researcher to make inference about the interest of the population and enable comparison of different variables at the same time (Bryman, 2012).

3.4 The Study Population and Sampling Frame

The study population was all candidates of ICBAE involved in selected adult learning centres in Tunduru District, while sampling frame was a list of adult candidates registered in centres that were involved in Integrated Community Basic Adult Education (ICBAE) in Tunduru District.

3.5 Sampling Procedure and Sample Size

3.5.1 Sampling procedure

Simple Random Sampling (SRS) through electronic random number generator was used to select 11 adult education centres out of 87 centres prior to data collection (Appendix 8). This helped to minimize bias in selection of adult education centres. The selected adult education centres were Mbesa (52), Namiungo (108), Nampungu (52), Naluwale (13), Kangomba (11) and Airport (152). Others were Kidugalo (41), Muhuwesi (12), Temeke (34), Nalasi (40) and Nangunguru (107). These centres have a total number of 622 adult learners (Table 1).

3.5.2 Sample size

A total number of 244 respondents were involved in the study. There are many approaches used in determining appropriate sample size for a study such as using census for a small population, published table and using formula. The sample size was above was calculated by using the Yamane's (1967) formula. Yamane's (1967) formula was used because the population in the study area was finite and its size was known. The formula also is simplified and practical for ease use by statistically unsophisticated researchers. Yamane's formula assumes a simple random sampling technique, a 95% confidence level and a 0.05 % level of precision. Yamane's formula that was used is represented as follows: $n=N/1+N(e)^2$

……...……..……. (1)

Whereby

N= Study population

n = Sample size

e = Level of precision

Total numbers of adult learners in 11 adult education centres were 622 candidates (Table 1) and distributions of respondents by gender (Table 2).

N= 622, e=0.05 levels of precision,

So, $n = 622/1+622\ (0.05)^2=24$

Therefore, sample size for the study, n=244 respondents'

Table 1: Distribution of respondents involved in study within the centres (n=244)

Name of adult centres	Centre populations	Centres sample size
Airport	152	61
Kangomba	11	5
Kidugalo	41	16
Mbesa	52	20
Muhuwesi	12	5
Nalasi	40	16
Naluwale	13	5
Namiungo	108	43
Nampungu	52	21
Nangungulu	107	39
Temeke	34	13
Total	**N=622**	**n=244**

The respondents were obtained through simple random sampling technique through electronic number generator.

Table 2: Distributions of Respondents by gender (n=244)

Name of adult centres	Males	Females	Total (n=244)
Airport	34	27	61
Kangomba	1	4	5
Kidugalo	5	11	16
Mbesa	13	7	20
Muhuwesi	2	3	5
Nalasi	5	11	16
Naluwale	0	5	5
Namiungo	27	16	43
Nampungu	8	13	21
Nangungulu	24	15	39
Temeke	8	5	13

Results in Table 3 show distribution of teachers teaching adult education programme in centres by gender. These teachers were responsible to teach adult education including ICBAE programme.

Table 3: Distribution of teachers involved the study within the selected adult centres (N=11)

Name of adult centres	Males	Females
Airport	0	1
Kangomba	0	1
Kidugalo	1	0
Mbesa	1	0
Muhuwesi	0	1
Nalasi	1	0
Naluwale	0	1
Namiungo	1	0
Nampungu	1	0
Nangungulu	0	1
Temeke	1	0
Total	**N=6**	**N=5**

3.6 Instrumentation and Data Collection

3.6.1 Instrumentation

Questionnaires, checklists and observation guide were used to collect both quantitative and qualitative data respectively. Checklists for key informants focus group discussion

(FGDs) and observation. Questionnaires were used to collect data from 244 adult learners from 11 selected adult education centres in Tunduru district, while the checklist of key informants was used to collect data from ward education officers for 11 adult selected education centres, one District Adult Education Officer, one District Adult Agricultural Education Officer and District Education Quality Assurance Inspector. Focus group discussion was conducted with four groups of four head teachers within the wards involved in the study. Meanwhile, observation guide was used to observe the existing agricultural programme in the study area.

3.6.2 Data collection

3.6.2.1 Primary data

Triangulation techniques were employed during primary data collection, namely: semi-structured questionnaire, Focus Group Discussion (FGD's), key informants Interviews (KII's) and Observation. The reason of using triangulation, it capture not only structured but also real situation and expressions of the respondents to add value of the study.

3.6.2.2 Semi-structured interview

Semi-structured questionnaire (Appendix 2) was adopted to guide data collection in order to achieve specific objective one to four to collect information from adult learners in their centres, household and farm by trained enumerator and researchers with a total of 244 adult learners. The questionnaire had both open and close-ended questions. The study used closed end question to guide the respondent direct to researcher need and the study used open end question to give respondents views and other detailed

3.6.2.3 Focus group discussion

Focus group discussion (FGD's) method of data collection was used to collect more detailed information and clarifications of issues in the given context which in one way was not exploited during semi-structured interviews. Therefore, in-depth views were obtained on the effectiveness of teaching agricultural programme to adult learners. Participants included head teacher in the area where Focus Group Discussion was conducted within the ward. These were in a better position to clarify issues raised and helped in elaborating hidden issues and themes. This made easy comparison of qualitative and quantitative information obtained during the survey.

Morgan (2013) suggested that for effective participation, participants in the FGDs should ranges from ten to fifteen, while group size range from two participants to ten participants. In this study, a total of 16 primary school head teachers were involved in the FGDs from four wards to generate in- depth information. The checklist was prepared and used in the FGDs. However, each four groups consist of four head teachers (Appendix 5).

3.6.2.4 Key informant interview

Key Informant Interviews (KII's) were used to gather relevant information to complement information obtained during the survey. A checklist was used to collect information from four key informants (Appendix 4). Key informant was selected based on their expertise and involvement in implementing the education policy of 1995 and 2014 respectively. These key informants were District Adult Education Officer, District Adult and Agricultural Officer, District School Quality Assurance Inspectors and Ward Education Officers. The District Adult Education Officer was the one who coordinate the adult education programmes within the district by the help of district adult education officer.

The district adult education officer his responsibility was the programme designer, coordinator and supervisor of the adult education programmes conducting agricultural programmes. The district quality assurance inspector was the inspector of measuring quality of adult education programmes and ward education officers was for coordinating, monitoring and supervision of the adult education programme within the wards.

3.6.2.5 Observation guide

An observation guide was used for the study. The observation gave a general overview of the real agricultural programme existing to adult learners. A list of items observed is attached (Appendix 6).

3.6.3 Pre-testing

Pre-testing of the instrument was done at the Mahauhau education centre at Sisi kwa sisi ward in Tunduru district by collecting information from adult farmers (non-participant of ICBAE). These included eight male and eight female participants who were randomly selected for the pilot study. Sisi kwa sisi village was selected for pre-testing because it had similar type of conditions and nature of respondents as those in the study area. The village was not included in the main study. Some modifications such as rephrasing, reducing and adding some questions were made to the instrument after pre-testing.

3.6.4 Secondary data

The relevant documents through documentary review were used for secondary data as follows described in Table 4.

Table 4: Secondary data information collected

S/N	Nature of data to be collected	Source of data	Location
1	Profession and qualifications of teachers who teach adult program	Teachers' file	District Education office
2	Existing adult class involved in agriculture	adult attendance registers	Head teachers' office within selected adult centres
3	Adult group's participation in agricultural programs	Adult attendance register in given centres	Head of schools' office, adults centres
4	Teaching and learning material for adult centres	procurement file at district education office	District education office
5	Effective inspection of quality adult education provision in centres	Current adult centres Inspection report	District Education Quality Assurance office
6	Books, journals, thesis and dissertations related to the study	Hard copies and published books, journals and Universal Readers Locator (URL)	Sokoine University of Agriculture Library

3.6.5 Data analysis

Quantitative data were analysed with the aid of Software Package for Statistical Analysis (SPSS), version 16 for each specific objective one, two, three and four. Qualitative data were analysed through content analysis whereby the key participants talk were recorded, written and translated and later extracted the phrase relevant to the issues to be discussed.

3.6.5.1 Quantitative data

Quantitative data to achieve specific objectives one were analysed through Binary Logistic Regression Model to determine socio-economic factors of adult learners toward involvement in the agricultural programme in adult education centres, which can contribute on the effectiveness of teacher teaching agricultural programme in adult

centres. Six (6) variables were used that include the age of adult learners; sex; marital status; income; occupation and education level of adult learners (Table 5).

A Binary Logistic Regression equation was specified as follows:-

Logit (C*i*) = *ln* (C*i* /1- C*i*) = $\alpha + \beta_1$Age+ β_2 Sex + β_3 marital status + β_4 occupation + β_5Education + β_6Iincome+ εi..... (2)

Whereby α=constant term, β=coefficients, εi= error term

The Binary Logistic Regression model allowed testing model, to predict outcome with two or more categories, continuous or both variables. The technique used various assumptions include:-

i. Predictors (independent) variable can be either categorical or continuous or in a mix of both in the one model as they are useful in exploring the predictive ability of sets or block of variable (Tabachnick and Fidell, 2007).
ii. Dichotomous used independent variable.
iii. Sample size must be large enough to run descriptive statistics for each predictor
iv. Multicollinearity: By focusing on the coefficient. Tolerance value that was very low (less than 0.1) indicates the variable was highly correlated with other variable (Pallant, 2007).

Table 5: Independent variables in Binary Logistic Regression Model

S/NO	Description of Independent Variable	Independent variable in data view	Type of variables	Measures	Coefficient sign expected (+/-)
1	Age	A4	Continuous	Numbers of years	+
2	Sex	A3	Categorical	1=Male 2=Female	+
3	Marital Status	A7	Categorical	1= Married 2= Single 3=Otherwise (specify)	+
4	Occupation	A8	Categorical	1=Crop production only 2= Livestock keeping only 3=Livestock and crop production activity 4=Government salary 5=Other business	
5	Education level of adult learners	A6	Categorical	1=No-formal education 2=primary education 3=Secondary education 4=Posts-secondary	+
6	Income resource of adult learners	A9	Continuous	Selling crop produce, Selling livestock produce and by – produce, selling crops and livestock product,	+

Note: A3, A4, A6, A7, A8, A9 represents independent variables

Specific objective two: Assess adult learners' knowledge level of agricultural programme

The researcher wanted to explore and to know type of agricultural programme and micro-economic topics that were taught in adult education centres. The agricultural and micro-economic topics that needed to be taught in the centres were four skills, namely crop production, livestock keeping as per learners' interest, environmental conservation and natural resources management. The analysis used descriptive statistics such as frequencies and percentages. In addition, cross tabulation and chi-squares were used to determine significant associations among variables. Variables used to assess the specific objective two were (B1-B13) (Appendix 2).

Specific objective three: Assess application of agricultural programme practices to adult learners

To assess the respondents' level of application of agricultural programme practices was required to answer eight variables (C1-C8) and its indices (Appendix 2). These variables were able to assess the level of effectiveness of teachers in teaching agricultural programme through ICBAE. The researcher wanted to know whether the basic agricultural programme practices acquired by learners during class session from their teachers match's with Logic Education Model (LEM) (Lawton *et al.*, 2014). The LEM show Inputs-Process-Output- Impact. The study wanted to establish whether input as knowledge of the agricultural programme was disseminated as required by teachers and output on the other hand was to assess an application of technologies in daily basis. Therefore, the researcher assessed whether adult learners apply knowledge of agricultural technologies in agricultural programme themes such as crop production, livestock production, environmental conservation and natural resources management and in

micro-economics. If the respondent answered yes, means that he/she applied the technologies related to the themes above.

Specific objective 4: Assessing perception of adult learners' on effectiveness of teachers teaching adult learners

To assess adult learners' perception toward the effectiveness of teachers teaching agricultural programme in ICBAE, Likert scale type of rating was used. From these eight items, respondents were expected to indicate whether strongly agreed, agreed, undecided, disagreed or strongly disagreed with each of the statements. Strongly agree and agree were later combined and treated as a positive opinion(s). However, strongly disagree and disagree were combined and treated as negative opinion(s). The undecided or neutral response indicated that the respondent knew nothing or were not sure on the issues asked.

3.6.5.2 Qualitative data

Qualitative data from key informant, focus group discussion were analysed by content analysis, through the recording of issues discussed, transcribing and making extracts of relevant materials needed to support or not to support quantitative data from the area of study.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSIONS

4.1 Overview

This chapter presents and discusses results based on specific objectives and research questions of the study. The first section describes the socio-economic factors of the respondents, while section two discusses respondents' knowledge on agricultural programme. The third section discusses the result on application of agricultural programme practices by adult learners. Lastly, the fourth section presents results and discussion on the perception of adult learners on effectiveness of teaching agricultural programme.

4.2 Socio-economic Factors of Adult Learners and Teachers' characteristics in the Selected Centres

4.2.1 Socio-economic factors of adult learners

Results in Table 6 indicate that 52% of respondents were males and 48% were females, meanwhile, the Naluwale adult centre had only female respondents 100%, followed by Kagomba adult centre where 80% of respondents were female. This result implies that based on sex the population was normally distributed. The study concurs with Batwa and Kamwela (2010) who found that males who joined in Integrated Community Based Adult Education (ICBAE) in 2008 in Tanzania were 551 331 (52%) while females were 507 793 (48%).

Furthermore, on education level, more than three quarters, 86%, of respondents didn't attain formal education, while 12.7% of respondents attained primary education level and only 1.2% attained secondary education level. This result implies that respondents were

not able to access the basic 3R'S (simple mathematics, writing and reading) which can help them to capture technologies through the agricultural programme for transforming their lives.

Results on marital status indicate that most respondents were married, that is 66.6%. Therefore, respondents were willing to leave other duties to participate in an adult education centre especially in ICBAE programme. Finally, results indicate that most of the respondents in the programme were above 25 years old, while 2.5% respondents were between 18 and 25 years of age. Other respondents were normally distributed and were above 26 years old accounting for 32.4%, above 36 years old were 31.6% and above 46 years were 33.6%. The age above 46 years enables someone to take own initiatives in learning especially income generation activities for his /her survival.

In occupation, 71.3% of respondents reported to involve themselves with crop production only as their source of income and food security in their family, whereby in the Muhuwesi adult centre all respondents interviewed, 100% did not have any livestock like local chicken, goats and others. Of 244 respondents, 13.9% respondents engaged both in crop production and livestock production mainly in local chicken production, while 13.9% of the respondents engaged in petty business. In Kidugalo adult education centre, 6.2% respondents reported to engage in petty business. In Mbesa adult education centre, 50% of respondents engaged in tailoring, carpentry and joinery activities. Others were from the Nalasi adult education centre who were 12.5%, Airport adult education centre were 11.5%, the Naluwale adult education centre was 20%, Namiungo adult education centre were 9.3%, the Nampungu adult education centre had only 4.8%, while Temeke adult education centre were 10%. These results imply that all respondents have own experiences in doing business. Therefore they need agricultural programme classes so that

they can be equipped with modern knowledge and skill to sustain their off farm activities. With regard to average annual income earned by the respondents, the results show that 47.5% of respondents earned below Tsh. 250 000/= per annum income from their source of income and 41% of respondents earned between Tsh. 250 001 and Tsh. 500 000/= and very few respondents of 7.4% earned per annum income above Tsh. 500 001 and Tsh. 1 000 000/=respectively, while only 4.1% respondents earned per annum income above Tsh. 1 000 000/=.

Table 6: Socio-economic characteristics of the respondent (n=244)

Responses	Airport (n=61)	Kangomba (n=5)	Kidugalo (n=16)	Mbesa (n=20)	Muhuwesi (n=5)	Nalasi (n=16)	Naluwale (n=5)	Namiungo (n=43)	Nampungu(n=21)	Nangungulu(n=39)	Temeke (n=13)	Total (n=244)	Chi-square	**P-value**
Sex: Male	34(55.7)	1(20)	5(31)	13(65)	2(40)	5(31.2)	0	27(62.8)	8(38)	24(61.5)	8(61.5)	127(52)	20.50	0.025*
Female	27(44.3)	4(80)	11(68.)	7(35)	3(60)	11(67)	5(100)	16(37.2)	13(62)	15(38.5)	5(38.5)	117(48)		
Marital status														
Married	36	2	9	12	4	15	2	26	17	33	6	162(66.4)	22.35	0.013*
Single	25	3	7	8	1	1	3	17	4	6	7	82(33.6)		
Education level														
No formal education	61(100)	5(100)	16(100)	20(100)	5(100)	12(75)	5(100)	43(100)	9(42.0)	21(53.8)	13(100)	210(86.1)	98.42	0.000**
Primary school	0	0	0	0	0	3(18.8)	0	0	11(52.4)	17(43.6)	0	31(12.7)		
Secondary school	0	0	0	0	0	1(8.2)	0	0	1(4.8)	1(2.6)	0	3(1.2)		
Age														
Below 25 yrs	0	0	0	0	0	0	0	0	0	0	6(46.2)	6(2.5)		
26-35 yrs	19(31.1)	2(40)	6(37.5)	4(20)	1(20)	4(25)	1(20)	14(32.6)	14(66.7)	10(30)	4(30.8)	79(32.4)	142.9	0.000**
36-45 yrs	16(26.2)	3(60)	4(25)	7(35)	0	7(43.8)	3(60)	6(28.6)	6(28.6)	18(44)	0	77(31.6)		
Above 46	26(42.6)	0	6(37.5)	9(45	4(80)	5(31.2)	1(20)	1(4.8)	1(4.6)	11(36)	3(23.1)	82(33.6)		

Variable	Name of adult centres													
	Airport (n=61)	Kangomba (n=5)	Kidugalo (n=16)	Mbesa (n=2)	Muhuwesi (n=5)	Nalasi (n=16)	Naluwale (n=5)	Namiungo (n=43)	Nampungu (n=21)	Nangungulu (n=39)	Temeke (n=13)	Total (n=244)	Chi-square	p-value
Adult learners occupation														
Crop farming activities only	53	15	15	10	5	14	4	32	1	28	9	174(71.3)	17.85	0.000**
Livestock and crop production activities	1	0	0	0	0	0	0	7	19	7	0	34(13.9)		
Other business out of agriculture	7	2	1	10	0	2	1	4	1	4	4	36(14.9)		
Income														
Below Tsh 250,000	32	0	10	1	3	7	1	30	0	20	3	116(47.5)		
Tsh 250,000-Tsh 500,000	21	4	4	8	2	4	4	11	18	15	9	100(41)	17.85	0.000**
Tsh 500,001-Tsh 1,00,000	4	1	1	2	0	3	0	2	3	1	1	18(7.4)		
Tsh 1,000,000 and above	4	0	1	0	0	2	0	0	0	3	0	10(4.1)		

Note: Figures in parentheses are percentage and those out of parentheses are frequencies,* = significant at ($p<0.05$), **=Significant at ($p<0.01$)

In addition, chi-square test results in Tables 6 shows that P-value was less than alpha 0.05, which led to failure to reject the statement that socio-economic factors influencing adult learners to agricultural programme. Therefore, there was a significant association between socio-economic factors and adult to learn agricultural programme.

Binary Logistic Regression was performed to assess the impact of factors on the model that respondents would report that whether or not teaching agricultural programme in adult centres was effective. The model consists of six independent variables (Age, sex, Marital Status, Occupation, Education and Income)

Logit (C*i*) = *ln* (C*i* /1- C*i*) = $\alpha + \beta_1$Age+ β_2 Sex + β_3 marital status + β_4 occupation + β_5Education + β_6Iincome+ εi..... (2)

Whereby α=constant term, β=coefficients, εi= error term

In interpretation of output from binary logistic regression, first thing was to check for details concerning sample size which provided in case processing summary table, next table was to check for dependent variable encoding which tells on how dependent variable looks like (in this study, whether teaching agricultural programme to adult learners was effective or not (yes=1 means effective, and no =0 which is not effective) then check on categorical variable coding for (independent) predictor and the next section was to check for output headed block 1 this is where the model (sets of predictors variables) fit in the model or not.

Results in Table 7 show that the full model containing all predictors was statistically significant, X^2 (6, n=244) =52.077 and p<0.000 through Omnibus Test of Model Coefficients which gives an indication of how well the model performs over the result. This refers as goodness of fit. For the set of results that is highly significant, the

(significant value should be less than or equal to 0.05) (Pallant, 2007). In this case the value p=0.000, indicating that the model was able to distinguish between respondents who reported whether teaching agricultural programme was effective or not to adult learners. The useful of model cox and Snell R square and Nagelkerke R square value provide an indication of variation between independent variables explained by the model (from a minimum 0 to maximum approximately 1). These were described as pseudo R square statistics. In the model, two values were 0.192 and 0.433 respectively, suggesting that the Model as a whole explained between 19.2 % (Cox and Snell R square) and 43.3% (Nagelkerke R squared) variability of a set of variables (Pallant, 2007). The β values provide information which was used in an equation to calculate the probability of a case falling into specific categories. The β values could be positive or negative which tell about the direction of the relationship, positive relationship refers as factors increase the likelihood of yes answers and which factors decrease it by coded all dependent variable and independent variable categorical or continuous correctly (with 0=no, or teaching agricultural programme was not effective; 1=yes, or the presence of characteristics).

Table 7: Binary Logistic Regression results on socio –economic factors of adult learners on effectiveness of teachers teaching agricultural programme (n=244)

Variable	β	S.E.	Wald	df	Sig.	Exp(β)
Sex of respondents	1.422	.616	5.325	1	.021*	4.144
Highest education level	1.917	.505	14.411	1	.000**	6.798
Marital status	-1.519	.764	3.951	1	.047*	.219
Occupation	1.050	.366	8.247	1	.004*	2.858
Age of respondent	-1.158	.396	8.561	1	.003*	.314
Income	.774	.331	5.453	1	.020*	2.168
Constant	-5.442	1.934	7.920	1	.005*	.004

*= significant $p \leq 0.05$. **significant $p \leq 0.01$

In this study, these positive coefficient variables were sex of respondents (1.422), highest level of education of the respondents β value = (1.917), occupation β values= (1.050) and income β values= (0.774). Negative β value indicates that an increase in the independent variable score will result in a decrease probability of the case of recoding a score of 1 in the dependent variable. In this study, the variables measured socio-economic factors of adult learners with respect to effectiveness of teaching agricultural programme in adult learners that show negative β values were marital status β values= (-1.519) and age of respondents β values= (-1.158) (Table 7). This negative β value for marital status indicates that as more married respondents increased their involvement in adult learners classes, the less likely to report having ineffective teaching of agricultural programme in their centres.

For the four other significant categorical or continuous variable (sex of respondents, highest level of education of the respondents, occupation and income), β values were positive. This suggested that adult learners attending agricultural programme in adult classes were more likely to answer 'yes' to the question whether teaching agricultural programme in ICBAE was ineffective. However, another piece of information about the contribution of or importance of each predictor variable was tested by using Wald test. The test provided the value of the statistic for each of predictor in the column of wald and the all values less than 0.05, contributed significantly to the predictive ability of the model.

In this study, all predictor variables were predictive significant variables (Sex of respondents, p=0.021, Highest education level, p=0.000, Marital status, p=0.047; Occupation, p=0.004, age of respondents, p=0.003, and income, p = 0.020). Furthermore, another useful piece of information in the variable as shown in Table 7 was provided in

the expected β (Exp β). These values are odd ratios (OR) for each of independent variable. The odd ratios represent the change in odds being in one categories of outcome when the value of predictor increases by one unit (Tabachnick and Fidell, 2007; Pallant, 2007). Results in Table 7 show that age of respondents (re-A4) had a negative relationship by the coefficient (-1.158) in attending the agricultural programme in their adult centres and it was statistically significant at p=0.003. This implies that the age of respondents' does not contribute to learning agricultural programme. Probably this happened due to that fact that the adult is self-directed, and they need knowledge and skill for their life survival.

Sex of respondent (A3) was statistically significant at p=0.021 and showed a positive relationship with effectiveness of teaching agricultural programme in adult centres. This result implies that males and female respondents had influences in learning.

Marital status (A6) was also significant predictor, (p=0.047). The odds ratio for this variable, however, was 0.219 less than 1. This indicates that as more adult married learners involved in ICBAE classes they are less likely to report the effectiveness of teaching agricultural programme in adult classes. That is, for every extra year of attaining adult classes of ICBAE, the person's chance for reporting effectiveness of teaching agricultural programme decreases by the factor of 0.219.

Occupation of respondents (A8) shows positive relationship and coefficient were statistically significant, p=0.004 and odds ratio for this variable was 2.858. This implies that the chance of adult learners reporting to involve in both crop production and keeping domestic animals was 2.8 times higher than adult learners who reported to involve in crop production only. Therefore, this suggests that adult learners wanted skills and knowledge

of agricultural production and livestock production from their centres. This study complies with that of Nzigula (2015) who found that adults utilise modern skills acquired in the agricultural programme to engage in agricultural production and value addition activities at household level.

In this study, as far as socio-economic is concerned, the higher education level was statistically significant (p=0.000). The chance for respondents reporting to have no formal education was 6.789 times higher than respondents who reported having formal education at least primary school level. This implies that the majority of adult learners did not attain formal education which can be able to read, write and perform simple arithmetics. This is supported by participants from Mbesa Focus Group Discussion who pointed out that:-

A number of adult learners who involve in ICBAE classes did not attain formal education, so it is difficult to introduce new approaches and methodology of teaching agricultural programme like lecture method and providing leaflets, articles, books, and let them go and implement what is in training materials.' (FGD 3, Female teachers). Teachers in the FGD said;

'*We need to teach adult classes on Integrated Community Based Adult Education (ICBAE) on adult selected themes but we don't have any teaching modules which makes it difficult to teach agricultural programme instead we teach only 3R'S (writing, reading and simple arithmetic)* (FGD I at Nandembo Education Ward).

Therefore, this indicates that most teachers in adult learners' centres were taught only three skills of reading, writing and mathematics. This is to say that even if the teachers were available in the centres but their teaching agricultural programme to adult learners were ineffective. This is because teaching materials were not available and they have low skills of agricultural teaching methodologies (Table 8).

In this study, source of income of adult learners with respect to effectiveness of teaching agricultural programme shows positive relationship and was statistically significant, p=0.020 and odds ratio value was β = 2.168. This means that as a source of income of learners increases, the chance for a person reporting that teaching agricultural programme were not effective increased by 2.168 times than those reporting that teaching agricultural programme were effective. The result means that teachers need to be equipped with more knowledge on modern agricultural technologies. This will enable them to equip adults with knowledge and skills to undertake income generation activities. In addition, adult learners with more income are better able to purchase agricultural inputs necessary for agricultural production, hence positively influencing the development of their children.

4.2.2 Teachers' characteristics in the study area

Teachers' personal and situational characteristics were used to assess their relation to effectiveness in teaching agricultural programme. In this study, teachers' characteristics include, sex, age, marital status and on the other hand the situational characteristics of teachers were professional qualification in agricultural courses, receiving in-service training, availability of teachers and learners' modules, methods of teaching agricultural programmes used in centres and methods used teaching 3R's.

Table 8: Distribution of Teachers' Characteristics in selected adult centres (N=11)

Variables	Name of centres												
	Airport	Kangomba	Kidugalo	Mbesa	Muhuwesi	Nalasi	Naluwale	Namiungo	Nampungu	Nangungulu	Temeke	Total	percent
Sex: Male	0	0	1	1	1	0	1	1	0	0	1	6	54.5
Female	1	1	0	0	1	0	1	0	0	1	0	5	45.5
Age:25-35		1	1									2	18.2
36-45				1	1	1	1		1			5	45.4
46-55	1									1		2	18.2
56-60								1			1	2	18.2
Status married	1		1	1	1	1		1	1	1	1	9	81.8
Single		1					1					2	18.2
PQA: Yes											√	1	8.1
No	√	√	√	√	√	√	√	√	√	√		10	90.9
In-service Training: yes													
No	√	√	√	√	√	√	√	√	√	√	√	11	100.0
Method													
Lecture													
Call for Expert									√			1	8.1
Demo													
None of above	√	√	√	√	√	√	√	√		√	√	10	90.9
Teaching 3R'S: YES	√	√	√	√	√	√	√	√	√		√	10	90.9
NO										√		1	8.1

Note: **PQA**=Professional Qualification in Agriculture, **Status**=Marital status

4.2.2.1 Sex of teachers respondents

The result in Table 8 show that males teachers teaching adult education programme particularly in the Integrated Community Based Adult Education (ICBAE) programme were 54.5% and females teachers were 45.5%. This result implies that in the study area teachers' sex was normally distributed.

4.2.2.2 Age of teachers in study area

The result indicates that teachers teaching adult programme through ICBAE varies, such that the age from 25-35 years there were 18.2%, aged from 36-45 years were 45.4%, aged from 46-55 years old were 18.2% and the aged teachers from 55-60 years were 18.2%. This result implies that the age of teachers provide rich information on effectiveness in teaching agricultural programme, for instance at the age of 25-35 years, teachers have higher ability to facilitate the agricultural programme. This is because teachers in this category have long journey in teaching the programme. On the other hand, the teachers aged 55-60 years these were likely to handover teaching, so that when they involved in the programme make them easy to capture agricultural innovation for individual benefit and to the community delivery even after retirement.

4.2.2.3 Marital status of teachers in the study area

The result indicates that most of teachers (81.8%) teaching adult centres were married and only 18.2% were single. This implies that teachers might be fully participated in the programme with less family problems.

4.2.2.4 Teachers professional qualification in delivering agricultural programmes

The results Table 8 indicate that most of teachers, 90.9% teaching adult education programme particularly integrated community based adult education programme did not attend any professional course on agriculture. In this study, only 8.1% of teachers had qualifications in agricultural science. They attended certificate course for three months. Furthermore, results in Table 9 indicate that there were few teachers pursuing agricultural courses in the district. This implies at Tunduru District Council, teachers were not equipped with agricultural training to help teachers to teach adult learners effectively.

Table 9: Educational profile of Tunduru district teachers in relation to qualification in agriculture

Teachers' qualification	Male	Female	Number of teachers
Certificate in (environmental sciences)	1	0	1
Certificate in Agriculture	3	1	4
Diploma in General Agriculture	1	0	1
A degree in any agricultural sciences programme	1	0	1
Total	**6**	**1**	**7**

The School Quality Assurance pointed out that the Ministry of Education Science and Technology (MoEST) did not pay attention to the teaching agricultural programme in adult centres. Therefore, teaching agricultural programme through ICBAE was not effective. This is because there were no teachers and learners modules. In supporting the with regards to accessibility and availability of modules for teachers and learners findings pointed out that" *There was no single copy of both teachers' and learners' modules for teaching ICBAE in the district. Also, there was a delay in paying honoraria to teachers who teach in adult centres. There was no existing agricultural programme in many adult centres*" the District Education and Agricultural Officer (DAEO) said. In addition, the results show that in all selected adult centres, there were no teaching and learners modules. This implies that majority of teachers teaching agricultural programme in the

centres did not have basic agricultural knowledge and teaching materials. This suggested that teachers lacked methodologies of teaching adults in relation to new agricultural innovation and techniques in the themes of crop production, livestock keeping, micro-economic and environmental conservation control. Hence, teaching agricultural programmes to adult education centres was ineffective.

In addition, some participants suggested that there is a need to conduct in-service training with subject matter specialists for the agricultural programme. Therefore, adequate training should be arranged to facilitators on the mission and operations of programme, content, teaching methods and clear way of assessment of learning outcomes to alleviate 622 adults learners to 6 teachers pursuing agricultural training ratio of 1:103(Table 1 and Table 9).

4.2.2.5 Methods used by teachers in teaching agricultural programme in the selected adult centres

The result shows that in the selected adult education centres, 90.9% of teachers did not use any of the following: lecture, demonstration, and call for expert (subject matter specialists) agricultural teaching methods, while only 8.1% used one agricultural method such as call for expert concerned. It implies that teachers within their centres use their initiatives to run adult education programme. However, the results from Table 8 show that most adult selected centres, 90.9%, were teaching effectively adult education programme skills of writing, reading and simple arithmetic's (3R's). This implies that teachers were able to teach adult skills of 3R's due to the fact that the teachers were attending several seminars related to teaching literacy programme within and out of the district, so they were able to run adult literacy than intergraded community based adult education through agricultural programmes.

4.3 Assess Understanding of Knowledge of Agricultural Programme in Adult Education Centres

Result in Table 10 shows that in adult centres, teaching agricultural programme were not taught through ICBAE. The majority of adult learners, 91.4%, reported that they were not taught agricultural programme except Nampungu adult centre where adults involved themselves in fish production and pond management as reported by 8.6% of respondents. However, in the rest of adults centres, teachers taught (writing, reading and simple mathematics) 3R'S. About 84% respondents reported that they learnt only 3R'S (writing, reading and simple mathematics), while Nangungulu centre 16% respondents reported dropout from learning ICBAE. These results are qualitatively supported by the participant from Nandembo FGD who pointed out that;

" *Adult were motivated to join ICBEA for the sake of getting knowledge and skill for income generation like knowledge in agriculture instead the teacher in the centre teach 3R'S the same as what they teach pupils of standard one, which were not their interest hence refused to continue with study. This happen three years now in the centre where no adult learner pursued ICBAE*" (FGD 2, Female participants)

In addition, Ward Education Officer (WEO) as Key Informant Interviewee (KII'S) on the subject matter to why teachers teaching ICBAE were not teaching agricultural programme in their centre, he pointed out that*,"... since, I was appointed to be Ward Education Officer, I did not get any teaching module and learners' modules for teaching ICBAE. Also, has not attended any seminar on teaching adults since 2005. How can we be effective in coordinating and teaching such programme?* (KII 3, WEO). This implies that teachers were not well prepared in teaching agricultural programme for income generation through ICBAE. This implies that every teacher in their centre uses own initiative to teach adult learners. This means that teachers who are interested in teaching

agricultural programme can initiate the programme in their respective centres. For instance, at Nampungu adult centre they introduced fish ponds production due availability of water from Nampungu river. They used to call for expert to teach adult learners on fish production and pond management.

The findings is in line with Murtagh (2012) who found that ineffectiveness of adult teaching was due to management procedure along with internal and external communication system, lack of funds like honorarium and programme being made offered in an *ad hoc* manner by the education sector. Therefore, measuring effectiveness of teaching the agricultural programme to adult learners could be impossible, unless more effort is needed by the education sector and local government authority to re-enforce resource availability to facilitate teachers in the provision of agricultural programme knowledge.

Table 10: Respondents' understanding on knowledge of agricultural programme in adults education centres (n=244)

		Name of adult centre											
Variables	Response	Airport	Kangomba	Kidugalo	Mbesa	Muhuwesi	Nalasi	Naluwale	Namiungo	Nampungu	Nangungulu	Temeke	Total
Understanding on knowledge of agricultural programme	No	61(27.4)	5(2.2)	16(7.2)	20(9)	5(2.2)	16(7.2)	5(2.2)	43(19.3)	0(0)	39(17.5)	13(5.8)	223(91.4)
	Yes	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	21(100)	0(0)	0(0)	21(8.6)
Others (3R.S)	No		0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	39(100)	0(0)	39(9.0)
	Yes		61(29.8)	5(2.4)	16(7.8)	20(9.8)	5(2.4)	16(7.8)	5(2.4)	43(21)	21(10.2)	0(0)	199(91.0)

4.4 Assess Application of Agricultural Programme Practices by Adult Learners

Results in Table 11 indicate that respondents were not applying of knowledge of the agricultural programme in crop production, livestock keeping and in micro-economics. However, Result from FGD indicated that teachers did not teach the agricultural programme as evidenced during discussion, "*In our area I didn't teach agricultural programme to adult learners due to the fact that I don't know anything on agricultural programme. Also, there is no agricultural extension officer in our village, who could provide technical backstopping in teaching agricultural programme at the centre* (FGD 4, Male head teachers). In addition, participants in FGD lamented that "*It's not easy as you think to teach adults who want direct measures of their long problem like the need of livestock production, but we teachers don't have any seminar on livestock keeping and no teaching modules. Hence, it's difficult to meet adults' demand and some time there is no effort made by district education officers to implement ICBAE through teaching relevant issues like agricultural programme and small income generation to adult learners as adult motives to learning instead the education office insist 3R'S than agricultural programme*" (FGD 1,Male 3 participants). Respondents who reported applying techniques of environmental conservation and natural resource management were only 8.4% of respondents at Nampungu adult centre. They also involved in fish farming.

Again, the researcher assessed whether respondents applied the knowledge taught by teachers by asking whether respondents were members of any micro-economic groups like, VICOBA, SACCOS and revolving funds in their adult centres. Other issues assessed included whether adults practiced skill of bookkeeping and farm records management. Result from table 8 shows all 100% respondents indicate that adults did not apply skill of micro-economics in their study areas.

The Key Informant Interviewee (KII) pointed out that, "*It is difficult to assess learning technique in adult centres due to lack of teachers in centres and there is no teaching modules in which micro-economic themes should be taught*." (KII 4, Education Quality Assurance Officer). However, the result implies that failing to teach micro-economics to adult learners made the teachers to be ineffective in their teaching of the agricultural programme to adults. An important implication of micro-economic was to provide opportunities for adults to know the basics of micro economic for financial- literacy skills and use it to sustain their agricultural enterprises.

Table 11: Adult learners' application of basic agricultural technologies in agricultural programme (n=244)

Variable	Response	Frequency	Percent
Application of knowledge of agricultural technologies in crop production	No	244	100
Application of technologies in livestock keeping	No	244	100
Application of micro-economics knowledge	No	205	84
Missing (Non participants)		39	16
Application of conservation	No	223	91.6
Knowledge	Yes	21	8.4
Application of practice, engaging in soil erosion	Yes	21	8.4
Sources control (fish pond production)	No	223	91.6

In general, 91.4% of respondents show that teaching in adults centres in the ICBAE specifically agricultural programme was not effective (Table 11) and only 8.4% respondents indicated that teaching agricultural programmes in adult education centres was effective. It was from the Nampungu adult centre where, teachers contacted Ward Agricultural Extension Officer to assist in facilitating fish production and pond management in collaboration with the District Fisheries Officer.

Table 12: Response on whether teaching agricultural programme to adult learners, effective or not (n=244)

Variable		Name of adult centre												Chi-square	sig
		Airport (n=61)	Kangomba (n=5)	Kidugalo (n=16)	Mbesa (n=20)	Muhuwesi (n=5)	Nalasi (n=16)	Naluwale (n=5)	Namiungo (n=43)	Nampungu (n=21)	Nangungulu (n=39)	Temeke (n=13)	Total (n=244)		
Whether teaching agricultural programme were effective or not	No	61	5	16	20	5	16	5	43	0	39	13	223		
		27.4	2.2	7.2	9.0	2.2	7.2	2.2	19.3	0.0	17.5	5.8	91.4	244.00	0.000*
	Yes	0	0	0	0	0	0	0	0	21	0	0	21		
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	8.6		

**=statistically significant at p<0.001, df =10

Adult learners have already harvested twice in their ponds. This implies that there was a need to have effective link between other change agents and adult facilitator during the planning and implementation of the various programmes like agricultural programme to adult learners. The result is in line with the study of Nkunguu (2014) conducted in Mwanga district on the role of promoting adult programmes, that there was lack of understanding of roles of district education managers in implementing of adult education programmes, provision of teaching and learning materials and lack of supervision and monitoring adult programmes.

The results from chi-square in Table12 show that there is a statistical association of adult centres with reporting effectiveness in teaching agricultural programme at (p=0.000). The above explanation was supported by observation of the existing agricultural programme in an adult centre (Table 13).

Table 13: Observation of agricultural programme in adults centres (n=11)

Name of adult centres	Teaching resources available (facilities, equipment, teaching material, funds)		Condition of adult teaching resources (facilities) such as buildings, chairs, tables, library		Available teaching equipment(watering cane, hoes, spade, wheelbarrows, fish pond)		Available teaching materials (Teachers and learners Modules)		Available fund to run agricultural programme	
	Yes	No	Good	Poor	Good	Poor	Yes	No	Yes	No
Airport		√		√		√		√		√
Kangomba		√		√		√		√		√
Kidugalo		√		√		√		√		√
Mbesa		√		√		√		√		√
Muhuwesi		√		√		√		√		√
Nalasi		√		√		√		√		√
Naluwale		√		√		√		√		√
Namiungo		√		√		√		√		√
Nangungulu		√		√		√		√		√
Nampungu	√			√	√			√	√	
Temeke		√		√		√		√		√

The observations show that out of eleven adult centres observed, it is the only Nampungu adult centre that has available teaching resources like facilities, equipment, teaching

material and funds. The observation of agricultural resources in centres were similar to the study of Tesha (2018) conducted in selected secondary schools teaching agriculture, that there were no teaching resources like facilities, equipment and lack of funds to run agricultural projects with the centres.

4.5 Assessing Perception of Adult Learners on Effectiveness of Teachers on Teaching Agricultural Programme to Adult Learners

Results in Table 14 indicates that respondents reported that teachers in adult centres knew adults' needs. About 100% respondents argued that teachers listened to adults and planned for a time table to run adult classes in consultation with learners. This means that teachers accept education policies of 1995 and 2014 that all educational institutions are adult centres (URT, 1995; UNESCO, 2005; URT, 2014).

Table 14: Respondents' responses to perception of effectiveness of teachers on teaching agricultural programme (n=205)

Variable	Percentage of respondents' response on their level of agreements (n=205)					
	Agree	**Undecided**	**Disagree**	**Chi-square**	**df**	**sig**
My teacher knows adult needs	100	0	0			
My teacher prepare and distribute importance directives to adult learners	80.3	0	3.7	1.074	1	0.300^{ns}
My teacher prepares plans and evaluation of education activities	71.7	10.2	3.7	205.0	2	0.000**
My teacher is seen at working station only when there is an agricultural tour and always absent	0	6.8	93.2	1.715	1	0.190^{ns}
My teacher has sufficient skill and knowledge in delivering the agricultural programme to adult learners	10.2	87.8	2.0	3.250	2	0.197^{ns}
My teacher uses other experts (subject matter specialist) to teach agriculture issues	10.2	1.0	88.8	205.0	2	0.000**

*= significant $p \leq 0.05$. **significant $p \leq 0.01$ ns=not significant

Therefore, this is a positive statement. Also, results in Figure 3 show that 80.3% of respondents agreed that teachers in centres prepared their documents for teaching adult, but only 3.7% of respondents disagreed that teachers did not prepare and distribute important directives. In this case, the value of p= 0.300, is larger than the alpha of 0.05, so it can be concluded that the result is not statistically significant. This implies that there was no association between teaching agricultural programme and teaching 3R'S in adult centres.

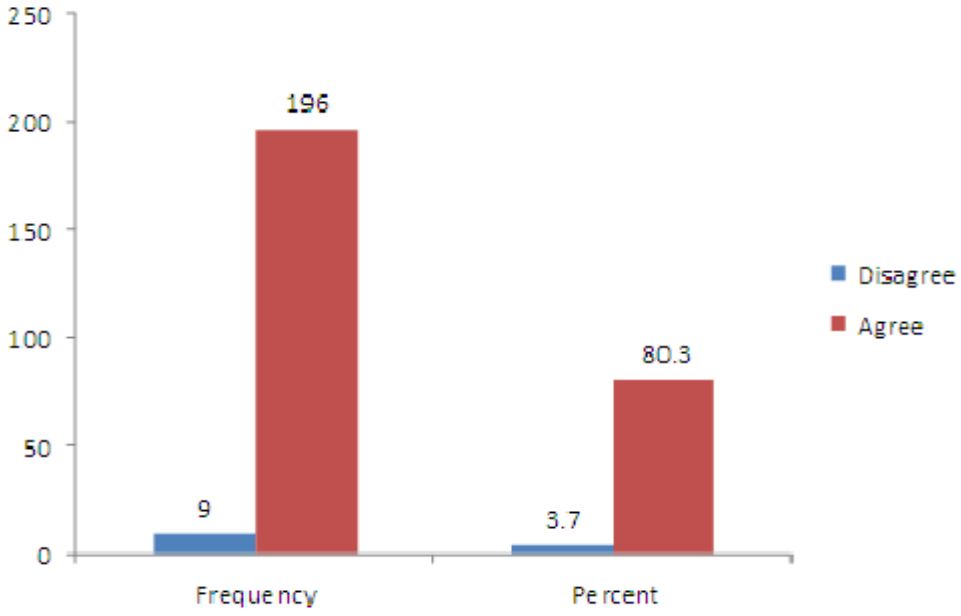

Figure 3: Response to whether teachers' teaching adult learners prepared and distribute important directives to learners

About 85% of respondents in Figure 4 agreed with the statement that teachers prepared plans and evaluated educational activities, while 10% were undecided and about 5% disagreed with the statement. The result indicates that above 50% of respondents had positive opinions. This is to say teachers prepare their teaching plan and evaluate educational activities. Therefore, teachers were able to teach adult classes. The statement was statistically significant at p=0.000 it can be concluded that the result was significant.

This implies that teachers in planning and evaluation of education activities were effective especially in connection to teaching 3R's.However, teachers were not effective in planning and evaluating agricultural programmes in their centres.

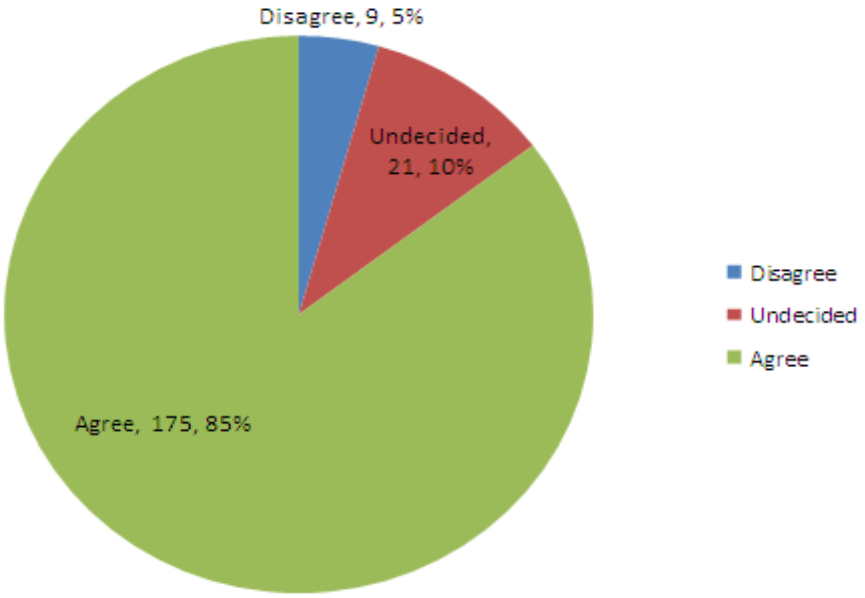

Figure 4: Response on whether teachers prepared plan and evaluated education activities

Result in Figure 5 shows that 2% of the respondents reported that they disagreed, while 10% of the respondents were agree. This implies that teachers were not doing their work based on motives like involvement in the agricultural study tour. In addition, the result indicates that 88% of the respondents were undecided on whether teachers who teach adult classes had sufficient skills and knowledge in delivering the agricultural programme or not. This implies that respondents were not able to judge on their teachers' capability that could contribute to effectiveness of teaching agricultural programmes in adult education centres.

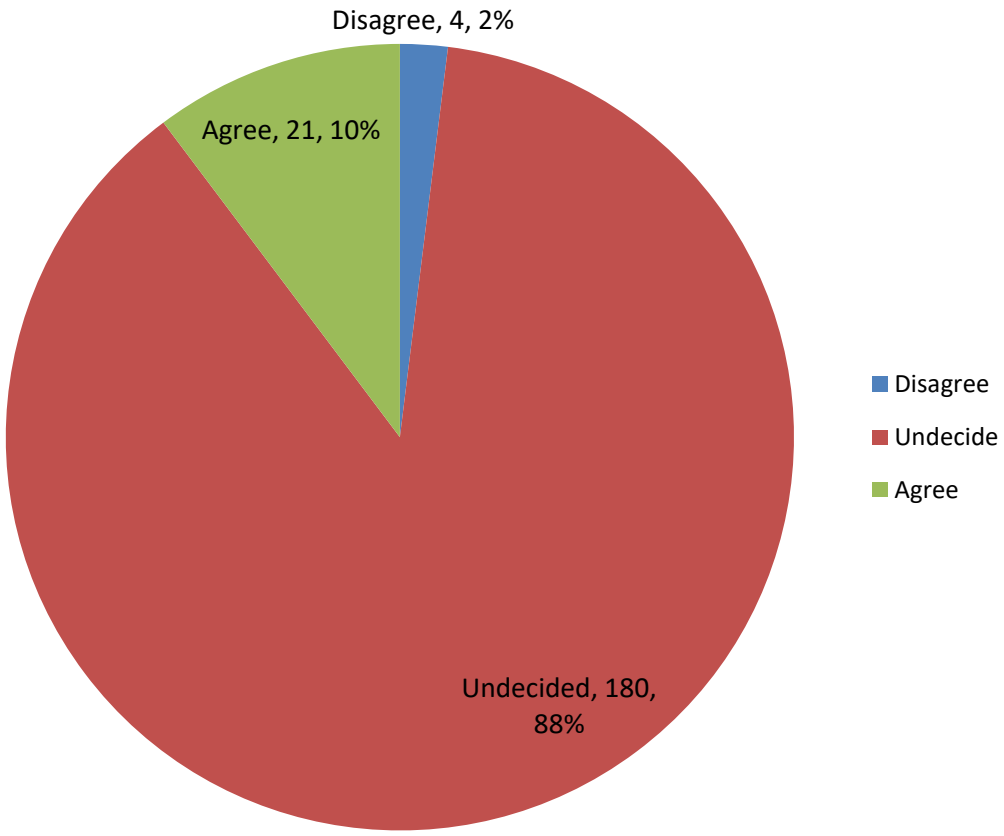

Figure 5: Teachers sufficiency in terms of skills and knowledge in delivering agricultural programmes to adult learners

Result in Figure 6 of the statement that teacher uses other expert like Subject matter specialists to teach agricultural issues, only 10.2% of respondent agreed and 88.8% disagreed. This implies that teachers did not use other teaching methodology in delivering education activities while teaching agricultural programme topics through ICBAE, hence teaching agricultural programmes in adult education centres was not effective.

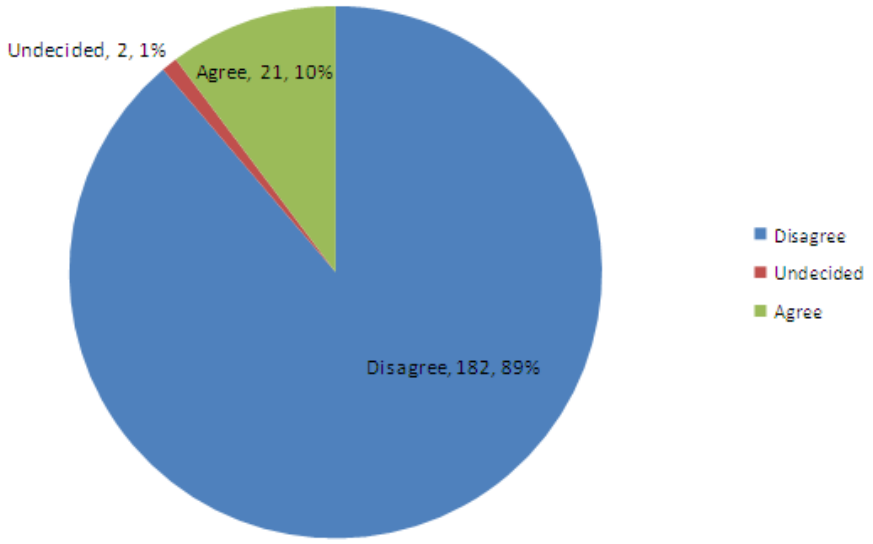

Figure 6: Response to whether the teachers' teaching agricultural programme use other subject matter specialists' to teach agricultural issues in adult centres

The results pertaining to learners' perception on effectiveness of teachers teaching adult learners was similar to the study by Martin and Omer (1990), on perceptions regarding instructional methods used in teaching agricultural programme that teaching was ineffective by teachers. However, they recommended that adult educators in agriculture should be updated on instructions in the identified methods and principles of teaching, and should be encouraged to carefully match instructional methods and tools to the subject matter content and learners' needs in agricultural programme.

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CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the study results, the following conclusions are made:

Socio-economic factors of adult learners and teachers' characteristics

This study concludes that socio-economic factors of adult learners such as sex, education level, occupation and income had a positive influence on teachers' effectiveness in teaching agricultural programmes to adult learners in centres in Tunduru district council. However, agricultural programme teachers lacked basic agricultural knowledge and teaching materials. Hence, has be able to teach literacy programme than teaching agricultural programme

Knowledge of the agricultural programme in adult learners in the centres:

The study concludes that there was variation in terms of accessibility of agricultural knowledge to adult learners through adult education centres in Tunduru district council. This is because availability of facilities for teaching modern knowledge on crop production, livestock keeping, micro-economic, environmental and natural resource conservation was limited to only one adult education centre out of 11adult centres. Hence, ineffective teaching of agricultural programmes to adult learners through Integrated Community Based Adult Education (ICBAE).

Assess application of agricultural programme practices by adult learners:

Application of the agricultural programme was limited to fish farming by adults who went through the Nampungu adult education centre in Tunduru district council. This is because the exploitation of potential for improving the practical application of agricultural

programmes in other adult centres was not effected due to lack of facilities and funds. Therefore, investing in financial resources, facilities and teaching material resources can improve adult centres' initiatives and creation of agricultural programmes based on agro-ecological requirement and learners' interest. It is likely that adult learners would get access to practicals on modern agricultural technologies, hence be able to apply the knowledge for increased production and income.

Perception of adult learners on effectiveness of teachers teaching adult learners:

This study concluded that although adult education teachers tended to indicate a higher level of regards for knowing learners' needs; preparing plans and evaluating education activities, they used poor teaching approach in agricultural programmes in the selected adult education centres. Hence, teaching agricultural programme in Tunduru District was not effective.

5.2 Recommendations

Based on the conclusions drawn from the findings, the following recommendations are made:

a) Skilled teaching staff

In alleviating inadequacy of skilled teaching staff of adult education programme, the ministry responsible for education, regional educational officer and district education officer should enhance the following:-

- ✓ Provision of in-services training and seminars for teachers on adult teaching methodologies on agricultural programmes through Wards Agricultural Resource Centres (WARCs) or nearby Teachers Teaching Colleges (TTC).

- ✓ Link between adult education centres and agricultural stakeholders like NGO's, CBO's, and Religious organisations performing agricultural programmes in the study area.

b) Provision of facilities for teaching agricultural programmes in adult centres

The institutions responsible for education such as Ministry of Education science and Technology, Institute of adult education and Local government authorities should adequately equip adult centres with teachers and learners' modules, demonstration farms, greenhouse and infrastructures and other materials.

c) Improving availability and accessibility of agricultural programmes through allocation of funds.

This study recommends that,

(i) The Tunduru District Council should set adequate funds to run the agricultural programmes. The funds will improve teaching processes, practical teaching and running demonstrations plots and ensure effective assessment of ICBAE within the centres.

(ii) Furthermore, the Council Management Team (CMT) from the district council, education department and other adult education providers should focus on training teachers and other change agents in facilitating agricultural programme in Tunduru district. This will increase effectiveness of teaching agricultural programmes.

d) Awareness creation on existence of agricultural programme in adult education centres

This can be achieved through:

- ✓ Announcements in the village meetings to request adults to engage in adult classes.

- ✓ Cooperation between teachers and other change agents within the district in provision of adult education. This can be done through initiating education campaigns, effective use of National adult education week and establishing adults groups on income generation activities.

e) Further areas of research

Since this study did not cover all districts in Tanzania and hence it might not easily be generalized to other areas, it is suggested that further study be conducted on 'Effectiveness of teaching agricultural programmes to adult learners in other districts in Tanzania.' This information could help to revitalise the ICBAE programme and incorporate an agricultural programme as core adult programme throughout the country, in order to enable generalisation of results.

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APPENDICES

Appendix 1: Summary of Methodology

The binary logistic regression model was used in this study in specific objective one to determine factors influencing effectiveness of teaching agricultural programme in adult education centres. Socio- economic characteristics were at a function of six (6) independent variables as used in the equation below:

Logit (C*i*) = *ln* (C*i* /1- C*i*) = $\alpha + \beta_1$Age+ β_2 Sex + β_3 marital status + β_4 occupation + β_5Education + β_6Iincome+ εi**..... (2)**

Whereby α=constant term, β=coefficients, εi= error term

Sn	Objectives	Types of data to be collected	Source of data	Method of data collection	Analysis
1	To determine socio-economic factors of learners toward achievement in agriculture programme and teacher characteristics	-Age, -Sex, -Marital status, -Income, -Occupation, -Education Teachers' characteristics-Age,-Sex,-Marital status -Professional qualification in agriculture**,-in-service** training, available teaching modules, teaching methods	-244 learners -7KI's -16 FGD's -11 teachers	-Questionnaire -Key informants guide -Focus group discussion, check list -Observation guide	Descriptive statistics on frequencies, percentage, cross tabulation and binary logistic regression. Content analysis of qualitative data.
2	To assess knowledge on understanding of agricultural programme	Knowledge on -Crop production -livestock keeping -Environment conservation -Natural resources	-244 learners -7KI's -16 FGD's	-Questionnaire -Key informants guide -Focus group discussion, check list -Observation	Descriptive statistics on frequencies, percentage, cross tabulation, Chi – square to determine significant association

		- Microeconomics		Guide	among variables. Content analysis of qualitative data.
3	To assess the application of agricultural programme practices	Application of practices on -Crop production -Livestock keeping -Environment conservation -Natural resources - Microeconomics	-244 learners -7KI's -16 FGD's	- Questionnaire -Key informants guide -Focus group discussion, check list -Observation Guide	Descriptive statistics on frequencies, percentage, cross tabulation, Chi – square to determine significant association among variables. Content analysis of qualitative data.
4	To determine the perception of adult learners on effectiveness of teachers on teaching agricultural programme	Learners improvement on -available food -livestock keeping -Environment conservation - Microeconomics	-244 learners	Questionnaire	Descriptive statistics on frequencies, percentage, cross tabulation, Chi – square to determine significant association among variables.

Appendix 2: Questionnaire for Learners'

PROJECT TITLE: Assessment of effectiveness of teaching agricultural programme to adult learners in selected centres in Tunduru, Ruvuma, Tanzania

Introduction

Dear respondent,

This questionnaire is for Msc study whose purpose is to assess the effectiveness of teachers in teaching agricultural programme in adult education centres in Tunduru District council. You have been selected to participate by giving sincere views on this issue. I, therefore, kindly request your participation. Feel free to give your opinions. Your response will treated with confidentiality.

[**Please, ask participant, if he/she consents to participate in the study by ticking on the box**] YES NO

Participant

I…… the enumerator responsible for the interview taking place in …….., 2017 certify that I have read the above statement to participate in the study and consented to the interview.

Section A: Socioeconomic Characteristics

A1. Name of the adult education centres…… (If applicable)

(**Please tick appropriate response**)

A2. Learners' category

1. Participant in ICBAE ( )
2. Non- participant in ICBAE ( )

A3. Sex of respondents

1. Male ( )
2. Female ( )

A4. Age of respondents by years…….

A5. How long have you been living in this village?

1. Since I have born ( )
2. Less than a year ( )
3. For past 1 year, -4 years ( )
4. For past 5 years, -9 years ( )
5. For the past 10 years and above ( )

A6. What is your highest level of education?

1. Primary education ( )
2. Secondary education ( )
3. Post-secondary ( )
4. Non-formal education (specify)……
5.

A7. What is your marital status?

1. Married ( )
2. Single ( )
3. Others (specify)……..……..

A8. What is your occupation?

1. Crop farming activities only ( )
2. Livestock keeping activities only ( )

3. Livestock and crop production activities ( )
4. Government employee ( )
5. Other, specify (mention)…….

A9. What is your source of income?

1. Selling crop produce only ( )
2. Selling livestock product and by product only ( )
3. Selling crop production and livestock product ( )
4. Salary ( )
5. Petty business ( )
6. Others (specify)……..

A10. Do you engage in agricultural activities?

1. Yes ( )
2. No ( )

A11. If **(answered YES in A10**), what type of agricultural activities do you mostly engage with?

1. Cultivation of crops ( )
2. Keeping Livestock ( )
3. Both crop and Livestock production ( )

A12. For any of crop how grown, how much have you/family earn in a last cropping season?

1. Below Tsh. 250,000 ( )
2. Tsh. 250,001-Tsh. 500,000 ( )
3. Tsh. 500,001- Tsh. 1, 000,000 ( )
4. Tsh. 1, 000,000 and above ( )

Section B: Assess Knowledge on Agricultural Programme

B1. Do you learn the Agriculture and micro-economic topics in this centre? (**Tick appropriate) 1=yes 2=No**

B2. If the answer is **YES in question B1i is agriculture and micro-economics**. Do you learn the following themes in agriculture and micro-economics?

S/NO	Themes with agriculture topics	Yes	No	Provide reasons for your answer
i	Crop production	Yes	No	
ii	Livestock production	Yes	No	
iii	Environmental conservation, and Natural resources	Yes	No	
iv	Others (specify)	Yes	No	

B3. Do teachers use various teaching methods in teaching agriculture programme? YES NO

B4. If answer **in question B3 is YES**, to what extent do you agree with the following teaching methods in helping you to acquire literacy, life and vocational skills necessary for undertaking chosen income generation activities?

Please rank in term of what the teacher was conducting the agriculture session [1=Strongly Disagree (SD), 2= Disagree (D), 3= Undecided (U), 4= Agree (A), 5= Strongly Agree (SA)]

S/NO	Teaching methods	Responses				
		SA	A	U	D	SD
i	The use of lecture method in the classroom (theory) only helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
ii	The use of a combination of theory and practical teaching helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
iii	The use of practical in the school farm / garden, helping me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
iv	The use of practical in village demonstration plot helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
v	The use of call for expert (subject matter specialist**)** helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
vi	The use of study tour helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
vii	The use of the home / field visit helps me to acquire literacy, life and vocational skills necessary for income generation activities	5	4	3	2	1
viii	Others (specify)…….	5	4	3	2	1

B5. In crop production session did you learn by practicing?

B6. If answer, is **YES in B5** in which themes? YES NO

S/N	Crop production themes	Response	
		Yes	No
i	Land preparation		
ii	Methods of seed selection and plant population		
iii	Methods of planting and lay out for perennial crops		
vi	Time for weeding		
vii	Gap filling and thinning techniques		
viii	Fertilizer type, application and rate in various crops		
ix	Crop pest prediction, identification and protection		
x	Disease control techniques in crops		
xi	Harvesting techniques		
xii	Post harvesting and storage techniques		

B7. In Livestock keeping session do you learn by practicing?

B8. If answer, is **YES in B7** in which theme? YES NO

S/NO	Livestock theme	Responses	
		Yes	**No**
i	Selection of livestock base on fecundity, gestation period,		
ii	Animal feed formulation		
iii	Importance animal pest and their control ways		
iv	Housing construction for light, ventilation, height		
v	Importance livestock disease in any given livestock		
vi	Negotiation process on livestock product and by product in marketing		
vii	Livestock record keeping		

B9 In environmental conservation, do you learn by practicing? YES NO

B10. If the answer is **YES in B9**, that they learn by practice, please in which themes

S/NO	Environmental conservation and natural resources theme	Responses	
		Yes	**No**
i	Tree nursery establishment in your centre		
ii	Tree planting around school or at your home		
iii	Planting fruit trees, wind breakers tree and cover crop trees		
iv	Soil erosion sources control		
v	Communal forest management skill		
vi	Provide forest conservation strategy		
vii	Tree planting programme		
viii	Control and protecting village water bodies		
ix	Beehive and honey production		
x	Fish pond making		
xi	Rain water harvesting techniques		
xii	Other skills (specify)……		

B11. In micro-economic, do you learn by practicing? YES NO

B12. If the answer is, **YES in B11** that they learn by practice, which themes practiced?

S/NO	Micro-economic themes	Responses	
		Yes	**No**
i	Are member in any micro- economic(i.e., VICOBA, SACCOSs, Revolving fund)		
ii	Is there any existing VICOBA in the adult centre?		
iii	Is the centre provide agro business skills?		
iv	Is there any revolving fund activities by adult centre members?		
v	Provide practical skills for bookkeeping and farm record management		
vi	Do you take a study tour to others to learn micro-economic activities		

B13. What do you think could be a most appropriate teaching method for you to be able to gain agricultural knowledge and skill for your future life survival?

1. ……
2. ……

Section C: Application of Basic Practices in Agricultural Programme

C1: Do you apply the knowledge of agricultural technologies in crop production

C2: If yes in **C1** in which area

S/N	Crop production themes	Response	
		Yes	No
i	Modern technologies for land preparation		
ii	Agricultural inputs		
iii	Methods of seed selection and plant population		
iv	Methods of planting and lay out for perennial crops		
v	Maintain time for weeding		
vi	Gap filling and thinning techniques		
vii	Fertilizer, application and rate in various crops		
viii	Crop pest prediction, identification and protection techniques		
ix	Disease control techniques in crops		
x	Post harvesting and storage techniques		

C3. In livestock keeping do you apply technologies, techniques of keeping livestock related to teachers teaching agricultural programme? YES NO

C4. If the answer is **yes in C3,** that he/she apply technologies or techniques of livestock keeping in which area?

S/NO	Livestock theme	Responses	
		Yes	No
i	Do you have livestock at your home (specify)		
ii	Selection of livestock base on fecundity, gestation period,		
iii	Technologies on animal feed formulation		
iv	The importance of animal pest and its ways to control		
v	Livestock housing construction for light, ventilation and height		
vi	Livestock disease technologies to control any given livestock disease		
vii	Negotiation process on livestock product and by product in marketing		
viii	Livestock record keeping		

C5. In environment conservation and natural resources management, do you apply by practicing it at your home or community? YES NO

C6.If the answer is **YES in C5** that they apply by practicing, which theme practiced

S/NO	Environmental conservation theme	Responses	
		Yes	No
i	Tree nursery establishment at the centre		
ii	Tree planting around school or at your home		
iii	Practicing at home or main field fruit tree, wind breakers tree, cover crop tree planting		
iv	Soil erosion sources control		
v	Engage in communal forest management?		
vi	Application of forest conservation strategy		
vii	Tree planting programme?		
viii	Application of knowledge on control and protecting village water bodies		
ix	Engage in beehive and honey production		
x	Engage in fish pond making		
xi	Rain water harvesting strategies to conserve water for agricultural usage to a period of water shortage		
xii	Other skills (specify)……		

C7. In micro-economics do you apply in your day to day basis? YES NO

C8. For Yes **response in C7,** if you apply micro-economics in day to day life basis, in which area?

S/NO	micro-economic themes	Responses	
		Yes	No
i	Are you a member in any micro- economic (i.e., VICOBA, SACCOSs, Revolving fund)?		
ii	Is there any existing in VICOBA in your centre?		
iii	Do you apply business skills to generate your income based on what has been taught in ICBAE		
iv	Do you engage in any revolving fund activities by adult centre members?		
v	Are you practicing skills for bookkeeping and farm record management?		

Section D: Assessing perception of adult learners on effectiveness of teachers on teaching agricultural programme

Please **tick** the number under the word that best reflects your feeling to each statement on the following rating scale **SA for Strongly agree =5, A for Agree =4; U for Undecided =3; D for Disagree =2 and SD for Strongly disagree=1**

S/NO	Learners' perception of teacher effectiveness	Statement	SA	A	U	D	SD
D1	What is your perception of effectiveness of teachers on teaching agricultural programme?	My teacher knows adults' needs (adults' interest at heart)	5	4	3	2	1
		My teacher prepare and distribute important directives to adult learners	5	4	3	2	1
		My teacher prepares plans and evaluation of educational activities	5	4	3	2	1
		My teacher uses work time to contact adult learners (dedication to work)	5	4	3	2	1
		My teacher is seen at working station only when there is a tour of government officials (hypocrisy)	5	4	3	2	1
		My teacher has sufficient skills and knowledge in delivering the agricultural programme to adult learners (professional)	5	4	3	2	1
		My teacher uses other experts (subject matter specialists) to teach agriculture issues	5	4	3	2	1

D2. What is the problem facing agricultural programme in adult education centres?

S/NO	Items	Yes	No
i	Lack of enough qualified teachers who teach agriculture at the centre		
ii	Lack of water facilities, buildings and agricultural equipment		
iii	Lack of capital to run agriculture projects		
iv	Agricultural programme has less priority in ICBAE		
vi	Other problems (specify)……		

Section E: Suggestions

E1. What is your suggestion for making agricultural programme effectiveness in adult education centres? (**Tick your suggestions**)

1. Re – introduce agricultural seminars to agricultural teachers who teach ICBAE ( )
2. Re- introduce in-service training for agriculture, and adult teachers at Vikindu Agriculture Teachers' college ( )
3. Conduct short courses on agricultural programmes through District Subject Matter Specialists (SMS) ( )
4. Encourage learning by doing ( )
5. Putting specific hours for training ICBAE learners ( )
6. In the corporate budget for field tour in running the agricultural programmes ( )
7. School inspector must inspect the adult education programme especially agricultural activities /Programme ( )
8. Establish more agricultural projects in adult education centres ( )
9. Others (specify)……

THANKS FOR YOUR COOPERATION

Appendix 3: Teachers' characteristics in selected adult education centres

T1. Teacher's sex in this centre

1. Male ( )
2. Female ( )

T2. Age of the teachers teaching adult education programme

1. 25-35 years ( )
2. 36-45 years ( )
3. 46-55 years ( )
4. 56-60 years ( )

T3. Marital status of the teachers teaching adult education programme in the selected centres

1. Married ( )
2. Single ( )

T4. What is professional qualification of teachers in agricultural

1. Certificate three months (environmental science course) ( )
2. Certificate one year course in agricultural science ( )
3. Diploma in agricultural science ( )
4. Degree in agricultural science ( )

T5. Teachers received in –service training of agricultural programme for past 3 years

1. Yes ( )
2. No ( )

T6. The centre has available teacher and learners modules for ICBAE programme?

1. Yes ( )

2. No ( )

T7. What commonly method of teaching agricultural programme in the centre?

1. Lecture ( )

2. Call for expert ( )

3. Demonstration ( )

4. None of the above method ( )

T8. Teachers in conducting ICBAE programme teach 3R’s skills in the centres?

1. Yes ( )

2. No ( )

Appendix 4: Interview guide for district adult education officers, district adult education and agricultural officers, and ward education officers

Research Title: Assessing Effectiveness of Teachers teaching Agricultural programme to Adult learners in Tunduru, Ruvuma, Tanzania

Name of Key Informant……. (Optional)

Mobile number……..

Designation…….

Main office/ Education Ward……

Questions

A: Socioeconomic characteristics of Adult education Teachers

1. What are teachers qualification in agriculture do you have?

S/NO	Teachers qualification	Male	Female
1	Certificate in (3 months, Environmental science courses)		
2	Certificate in Agriculture (I year course)		
3	Diploma in General Agriculture		
4	Degree in any agricultural science courses		

2. Since 2005, did agriculture teachers in your area undergone any training in agriculture?
3. If yes, what types of agricultural trainings?

S/NO	Agricultural trainings	Number of teachers	Training centre	Period of trainings

4. What are the marital status of teachers conducting adult education programmes?

S/NO	Marital status	Male	Female	Total
1	Married			
2	Single			
3	Widow			
4	Divorced			
	Total			

5. What methods are commonly used by teachers in teaching agricultural programme?
6. Can you comment on the availability of teaching and learners modules in the centres?
7. Can you comment on availability and existing school farms and garden?

D: Perception of teachers towards learners in teaching agricultural programme

8. Do learners need an agricultural programme? Yes/ No

   If yes, please explain……..

   If No, please explain……
9. What are teachers' perceptions toward teaching agricultural programme in adult education centres?
10. What are teachers' problems in teaching agricultural programme?
11. Please, give your opinions on how to improve teachers' effectiveness in teaching adult education especially for agricultural and micro-economics programme

    a) ……

    b) ……

THANKS YOU VERY MUCH FOR COOPERATION

Appendix 5: Interview guide for district school inspector

Project Title: Assessing Effectiveness of Teachers in teaching Agricultural programme in Adult learners in Tunduru, Ruvuma, Tanzania

Name of key informants…… (Optional)

Mobile telephone……

Designation……..

Questions for a key informant interview with Education Quality Assurance (District School Inspector)

1. How do you inspect the ICBAE programme in adult centres?
2. How do you inspect agriculture and micro-economic activities taught by adult facilitators?
3. Is there any existing self –reliant agricultural activities within adult centres Yes/No

   If the answer is YES explain how are they conducted?……..

   If No, what is the problem…….
4. Do you think teachers teaching agricultural programme competent? (No or Yes)

   If No, (Why?)…….

   If Yes, (How?)…….
5. Through your observations in many schools and adult centres, what are your suggestions towards making teaching agricultural programme effective?

   a) ……..

   b) ……..

THANKS FOR YOUR COOPERATION

Appendix 6: Checklist for focus group discussion

Name of Education Ward……..

Number of teachers involved……

Date of discussion……..

Questions for Focus Group Discussion in ward teachers school centres.

Question of teaching methodology used in adult programme

1. What are the commonly teaching methodologies for agricultural programmes?
2. Do you think the teaching methods are effective to provide sufficient skill to learners in career development? If yes, How?.....
3. What is your experience in teaching agriculture programme?
4. To what extent do you share knowledge and skill to other agricultural subject matter specialists (SMS) in agriculture session?

Questions on Conditions of teaching resources for adult education programme

5. Do school farm and garden exist for self-reliance activities? Yes or No
6. Is there any micro-economic group as a revolving loan fund in your centre (yes or No).If yes how does it operate?.....
7. What do you comment on the availability of equipment for agricultural training and how effective? Are they utilised?
8. How do you teach the following agricultural and micro-economic topic in your adult centre?

S/NO	Agriculture themes	Teaching method used (Mention)
i	Crop production topics	
ii	Livestock keeping production	
iii	Tree planting for natural resource management	
iv	Beehive keeping and honey production	
v	Fishpond production	
vi	micro-economics	

9. What is your opinion on the most effective way in teaching agricultural programme?
    a) ……
    b) ……
    c) …….

10. What are your recommendations for improving agricultural programme for future learners' career development
    a) School /adult level……
    b) Community level …….
    c) Ward level……..
    d) District council……
    e) District School inspector……..

THANKS VERY MUCH FOR YOUR COOPERATION

Appendix 7: Observation guide

1. Are the following teaching resources available in this adult education centre?

S/NO	Teaching resources	Responses	
		Yes	**No**
i	Available adult teaching facilities		
ii	Available equipment		
iii	Available teaching materials		
iv	Allocation of Funds (Honorarium, Agriculture projects)		

2. What are the conditions?]

What are conditions of adult teaching resources?			**Good**	**Poor**
1	Adults teaching facilities	Buildings		
		Chairs		
		Tables		
		Cupboard		
		Shelves		
		Library		
2	Availability of teaching equipment	Cultivation machine (hand hoes, power tiller,)		
		Watering can		
		Garden folk		
		Machete		
		Wheelbarrow		
		Spade		
3	Available teaching materials	Learners' module		
		Facilitators modules		
		Existing school farms		
		Existing school garden		
		Available seed and seedling for teaching		
		Available agricultural inputs (fertilizers, chemicals,)		
4	Funds available to run the agricultural programme		**Yes**	**No**
		Is the Centre get support from NGO?		
		Is your Centre registered as community Based Organisation (CBO)		
		Is there any support of fund from the government?		

Appendix 8: Electronic number generator

Use the Random Number Generator to create a list of random numbers, based on your specifications. The numbers you generate appear in the Random Number Table.

For help in using the Random Number Generator, read the Frequently-Asked Questions or review the Sample Problems.

- Enter a value in each of the first three text boxes.
- Indicate whether duplicate entries are allowed in the table.
- Click the **Calculate** button to create a table of random numbers.

Note: The seed value is optional. Leave it blank to generate a new set of numbers. Use it to repeat a previously-generated set of numbers.

How many random numbers?	11
Minimum value	01
Maximum value	87
Allow duplicate entries	False
Seed (optional)	

Random Number Table

Random Number Generator | Frequently-Asked Questions | Sample Problems

11 Random Numbers

65 51 05 31 18 79 48 52 87 55 78

pecs: This table of 11 random numbers was produced according to the following specifications: Numbers were randomly selected from within the range of 1 to 87. Duplicate numbers were not allowed. This table was generated on 01/2/2018.

Adult education centres In Tunduru conducting ICBAE

1	Ipanje	44	Namasalau	87	Kidugalo
2	Machemba	45	Ndenyende		
3	Msinji	46	Mdingula		
4	Ligunga	47	Nambarapi		
5	Temeke	48	Mbesa		
6	Mjimwema	49	Mkwajuni		
7	Marumba	50	Kidodoma		
8	Mamboleo	51	Nalasi		
9	Nambarapi	52	Naluwale		
10	Tunduru/M	53	Chajila		
11	Namiungo	54	Mea mtwaro		
12	Airport	55	Kangomba		
13	Chikomo	56	Msinjili		
14	Lukala	57	Tulivu		
15	Jiungeni	58	Mwangaza		
16	Sauti moja	59	Lipepo		
17	Mchoteka	60	Mkolola		
18	Airport	61	Chilundundu		
19	Majimaji	62	Majimaji		
20	Kitanda	63	msinji		
21	Tulivu	64	Marumba		
22	Matemanga	65	Nampungu		
23	Mhuwesi	66	Kitalo		
24	Katumbi	67	Mbatamila		
25	Msagula	68	Mjala		
26	Mtina	69	Mkambala		
27	Ngatuni	70	Tupendane		
28	Milonde	71	Azimio		
29	Tulieni	72	Chiwana		
30	Mtonya	73	Lukala		
31	Nangunguru	74	Umoja		
32	Mtotela	75	Tinginya		
33	Nakapanya	76	Misechela		
34	Nangolombe	77	Chiungo		
35	Nampungu	78	Namiungo		
36	Darajambili	79	Muhuwesi		
37	Majala	80	Rahaleo		
38	Nandembo	81	Kajima		
39	Nangunguru	82	Twendembele		
40	Cheleweni	83	Lijombo		
41	Namatanda	84	Mkasale		
42	Ngapa	85	Namasakata		
43	Chilonji	86	Ligunga		
44	Mdingula				
45	Tuwemacho				
46	Mahauhau				

Appendix 9: Independent variables used in Binary logistic regression

Variables	**Definition**	**measurements**
Age (A4)	Age of adult learners	Ratio in years
Sex (A3)	Sex of adult learners	Nominal (1=yes, 2= female)
Marital status (A7)	Marital status of adult learners	Nominal (1= married, 2=single)
Occupation (A8)	Occupation of the adult learners	Nominal (1=crop production, 2=livestock keeping, 3=livestock and crop production
Education level (A6)	Education levels of adult learners	Nominal (1=no-formal education, 2=primary education, 3=secondary education, 4= post-secondary)
Income (A9)	Income of adult learners	Ratio in TZS