

**A TRANSFORMATIVE LEARNING PERSPECTIVE ANALYSIS OF THE
AGRICULTURAL EXTENSION PROGRAMMES IN NGWEZI SETTLEMENT
SCHEME IN MAZABUKA, ZAMBIA**

BY

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**A Dissertation Submitted to the University of Zambia in Partial Fulfilment of the
Requirements for the award of the Degree of Master of Education in Adult Education**

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DECLARATION

I, Buumba Makala Precious, do declare that this dissertation represents my own work and that it has neither in any part nor in whole been presented as substance for award of any degree at this or any other University. Where people's work has been drawn upon, acknowledgements have been made.

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CERTIFICATE OF APPROVAL

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DEDICATION

This study is dedicated to God Almighty and to my mother, Buumba C. Belinda. Your love, support, and affection have been an inspiration in my studies. I am surely thankful to you and God bless you always.

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ABSTRACT

This study analysed the agricultural extension programmes from a transformative learning perspective in Ngwezi settlement scheme in Mazabuka District. The Ngwezi settlement scheme is located along the Ngwezi River plain which runs from the Magoye area eastwards for over thirty miles and is inhabited by small holder farmers. The study had three objectives: to examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme; to assess the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme; and to determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme. A descriptive design was employed by the study. Purposeful sampling was used to select extension officers and convenient sampling to select lead farmers and follower farmers. The total number of respondents presented in this study is 72 follower farmers, 20 lead-farmers and 3 extension officers. Data was collected using questionnaires and interview guides. Qualitative data was analyzed based on categorizing similar themes as they emerged and was presented in narrations. Quantitative data was analyzed using Statistical Package for Social Sciences and results was presented using frequency distribution tables. The study showed that the process of developing the curriculum for agricultural extension programmes was non participatory. The extension officers, lead farmers and follower farmers all indicated that they were not involved in the process of designing the contents of the agricultural extension programmes. With regard to the methods used the most common methods were the lecture format, group discussions, individual visits and demonstration plots in delivering content. The study also showed that farmers in Ngwezi settlement scheme were practicing what they learnt and that they were motivated to practice because their yields had increased. However, the farmers indicated that they were facing challenges with agriculture equipment; funds; poor rains; inputs such as seeds, herbicides, and fertilizer; infrequent visits from camp officers; markets; and agriculture shops. The other challenge is that follower farmers felt used by lead farmers to benefit inputs and hence, many follower farmers had withdrawn from the agricultural extension programmes. The study revealed that despite the relevance of the programmes in the settlement scheme, farmers still needed new lessons to be introduced and this was seen by the researcher as a gap that was created due to the fact that the owners of the programmes were left out in the process of developing the curriculum. In this regard, their needs were not taken into consideration. The study recommended that the Ministry of Agriculture should come up with a deliberate policy to ensure that projects and programmes intended to bring about development apply transformative learning principles. It also recommended that the government should urgently increase funding to the Ministry of Agriculture to improve the effectiveness of the extension system in Zambia.

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ACRONYMS

ADEO	Agriculture Diary for Extension Officers
ASNAPP	Agribusiness in Sustainable Natural African Plant Products
CAADP	Comprehensive African Agriculture Development Plan
CFU	Conservation Farming Unit
CO	Camp Officer
CSO	Central Statistical Office
DACO	District Agriculture Coordinator
EAS	Extension and Advisory Services
FFS	Farmers Field Schools
FSR	Farming Systems Research
GDP	Gross Domestic Product
MAL	Ministry of Agriculture and Livestock
MEAS	Modernization of Extension and Advisory Services (USAID LWA Project)
NAP	National Agriculture Policy
NAIP	National Agricultural Investment Plan
PACO	Provincial Agriculture Coordinator
PAO	Principal Agriculture Officer
PEA	Participatory Extension Approach
SAO	Senior Agricultural Officer
T & V	Training and Visit
WB	World Bank
ZNFU	Zambian National Farmers Union

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presents the background to the study and highlights the statement of the problem, purpose of the study, objectives, research questions, significance, limitations and delimitation of the study. It also highlights the conceptual framework, theoretical framework, operational definitions of terms, organisation of the study and summary of the chapter.

1.2 Background to the study

Farmers provide multiple goods and services to society, such as production of food, non-food products and are stewards of land to protect and enhance biodiversity. In addition, they play a key role in rural development and rural employment. IFAD (2002) explains that agriculture is the economic engine of most economies in sub-Saharan Africa (SSA) contributing at least 70 per cent of employment, 40 per cent of export earnings and 30 per cent of Gross Domestic Product (GDP) and up to 30 per cent of foreign exchange earnings. As a result the agriculture sector contributes to economic growth and poverty alleviation and hunger in developing countries. In Zambia, this sector contributes 18 to 20 per cent to GDP and provides a livelihood to 50 per cent of the population (CSO, 2006).

The Settlement programme started during the British South African (BSA) Company rule, founded by Cecil Rhodes in 1894 which was given authority and power to alienate land and move people as they searched for minerals. However, Mtonga (1983) argues that settlement of Africans was not regarded as a substitute for agricultural improvement or as a means of promoting agricultural development, even though simple measures of agricultural control and the beginnings of soil conservation and agricultural improvements were introduced in each of the settlement areas as a condition of occupation.

Magande (1975) explains that after independence many of the European farmers left Zambia, leaving behind their large landholdings in the crown land areas. This created a gap in the agricultural sector because the African farmers at that time could not grow the most marketed crops in the nation. Upon independence the government was faced with the problem of the country's food insecurity position created by the European farmers who had left, and the country's growing urban population.

As a way of solving this problem, the newly independent Zambia adopted the philosophy of humanism which committed to the policy of full employment, requiring that every able-bodied person be fully employed in some productive work. Consequently the government embraced the idea of giving land to people who wished to settle for agricultural purposes, through settlement in organized schemes, a move that has persisted as a key factor in the Zambian agriculture.

The Government of Zambia purchased the land that belonged to European farmers and distributed it to the local people and these became the site of many of the original settlement schemes (Mtonga, 1983). Chunga (2007) explains that the government also committed itself to supporting settled commercial farmers and medium- and small-scale farmers through research, credit, and extension services to facilitate expansion of production. These services were expanded to cover the whole country.

MAL (2013) states that in facilitating production expansion, extension officers used a model of extension that enabled each farmer to be contacted at their farms in the 1960s and early 1970s. However, this system proved to be expensive and ineffective due to the large number of farm households and the long distances between farms. Hence, from the late 1970s along with many other countries Zambia adopted the Training and Visit (T & V) Extension model of extension championed by the World Bank. MEAS (2014) argues that this model was promoted as a comprehensive management system to address issues of inadequately trained and office-bound extension field staff and a lack of accountability at all levels. Mbozi (2000) illustrates that the T & V model used three main contexts for delivering advice to farmers and these were individual visits to farmers, group meetings held in the community, advice given at camp offices and field days or demonstration plots.

MEAS (2014) explains that concurrent with Zambia's T & V extension experiment, Farming Systems Research (FSR) emerged as part of a larger effort to increase the relevance of agricultural research and extension for the small-scale farmer as it was a systematic attempt to involve smallholders more actively in research and technology testing so as to increase their productivity levels. However, by early 1990s the Zambian extension service faced issues of management of collective natural resources, value chain management, collective input supply and marketing. These issues called for new forms of coordinated action and cooperation among farmers and between farmers and stakeholders.

As such, in the year 2000, Participatory Extension Approach (PEA) was declared as the main vehicle for delivery of extension services following a government study with World Bank Support to look at ways of revitalizing agriculture extension services delivery. MAL (2013) illustrates that PEA has been used as an official extension tool by Camp and or Block extension officers of MAL to mobilize and empower the rural population by involving them in every step of the planning and implementation of community action plan (CAP) and the monitoring and evaluation activities.

Nonetheless, MEAS (2014) argues that the 2013 MAL document for agricultural extension service providers for Small-Scale Farmers in Zambia welcomes pluralism in extension service as it provides farmers with more opportunities to choose among different alternatives as the various extension service providers may offer different services. As such, the document details a plan for EAS coordination nested within District Development Coordinating Committees and backed up by Provincial Agricultural Coordinator (PACO) offices.

Thus, in order to provide extension services to farmers in a more cost effective way, agricultural camps are organized into approximately four to six zones. Farmers are further grouped into commodity study groups or interest groups where farmers are interested in forming such groups. MEAS report (2014) illustrates that Extension Officers regularly meet these groups and occasionally visit households to make follow-ups for specific farmer problems. The extension officers also identify lead farmers among the group and establish demonstration plots at their farms. MAL (2013) explains that these demonstrations when done hands-on throughout the crop and or livestock cycle are known as Farmer Field Schools (FFS). Through the FFS experiential learning is used to teach farmers to make learning practical.

Nonetheless, when the production levels for farmers are considered in Zambia, in light of the development that has been taking place in the Ministry of Agriculture, Chunga (2007) argues that in the 1970s production volumes and planting area both increased due to the introduced chemical fertilizer subsidies and the raised producer prices. However, production volumes dropped in the 1980s and have remained low even with the introduction of high yielding varieties and input subsidy programmes. Chiona (2011) explains that maize productivity stagnated between 1.3 metric tons and 1.8 metric tons from 1997 to 2007 a level which is

comparable to that of traditional varieties. A slight improvement was observed in the 2008 and 2009 farming season as productivity reached 2 metric tons per hectare.

JAICAF (2008) indicates that maize has experienced substantial reductions in productivity especially among the smallholder farmers who produce 79 per cent of Zambia's 1.2 million metric ton annual food requirement. Further, CSO (2006) reports that annual maize production in Zambia was on average 1.1 metric ton in the period 2000 to 2010, and average yields of about 1.5 ton per hectare that have not significantly changed over the past 20 years. Thus, Chiona (2011) points out that at the time of independence in 1964 and during the 1970s and 1980s, maize accounted for 60 per cent of the crop grown area. However, this ratio has fallen below 30 per cent since the 1990s.

From the above discussion it can be noted that farmers have shown commitment to the initiatives of the government by accepting the new knowledge and skills from the extension officers through participating in extension programmes. Hameja (2015) illustrates that small-scale farmers readily accept the new ideas and hence, there has been a tremendous increase in the sphere of adoption of improved methods of agriculture since the colonial period, involving the use of chemical, fertilisers, hybrid seeds, improved implements such as ploughs, harrows, cultivators. Kuteya and Msiska (2014) explain that small-scale farmers are subsistence producers cultivating less than 5 hectares while commercial farmers cultivate more than 20 hectares

1.3 Statement of the problem

Despite the implementation of the extension programmes in Ngwezi settlement scheme, by the department of agriculture extension farmers still experience low productivity. Chiona (2011) argues that the low levels of production among small scale farmers has resulted into low levels of development. It was not known to what extent transformative learning approaches were being used in agricultural extension in Ngwezi settlement.

1.4 Purpose of the study:

The purpose of the study was to analyse the agricultural extension programmes in Ngwezi settlement scheme from a transformative learning perspective.

1.5 Objectives of the study:

The objectives of the study were to:

1. examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme.
2. assess the instructional techniques of the agricultural extension programmes in Ngwezi settlement scheme.
3. determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme.

1.6 Research questions of the study:

The following were the research questions;

1. How is the process of developing the curriculum for agricultural extension farmers in Ngwezi settlement scheme?
2. What are the instructional techniques used in agricultural extension programmes in Ngwezi settlement scheme?
3. What are the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme?

1.7 Significance of the study

Through this study, the Ministry of Agriculture will be introduced to the learning transformational strategies that might help the department of agriculture extension to plan and implement agricultural extension programmes that are transformative in Ngwezi settlement scheme. As the study will suggest the process of curriculum development, instructional techniques, and contextual factors that influence the transformation of farmers who undergo agricultural extension programmes.

The study may also be of benefit to the farmers of Ngwezi settlement scheme as it may suggest possible solutions to the problem of low productivity, thus helping in meeting the Millennium Development Goal number 1 of eradicating extreme poverty and hunger. The study may also add to the body of knowledge in the area of agricultural extension programmes as well as Ngwezi settlement scheme.

1.8 Limitations of the study

The researcher was not able to conduct observations of participants because at the time of the research lessons were not being conducted. The researcher however, was able to triangulate the sources of information in the sense that the researcher collected information from various categories of people.

The researcher was unable to conduct random sampling because most farmers had withdrawn from the agricultural extension programmes. The researcher however, was able to get information from all the farmers in the 4 zones of Ngwenzi settlement scheme.

1.9 Delimitation of the study

The study was limited to Mazabuka district, particularly Ngwezi settlement scheme and to the activities of the department of agriculture extension in the scheme. This is because the department is the major provider of programmes to the farmers in the area. The department was established for the purpose of providing assistance to small-scale farmers in new agricultural practices and skills training.

This study was limited to Ngwezi settlement scheme because it is among the first settlement schemes to be established and settle people where improved farming methods were to be introduced. People started settling in Ngwezi in 1964, with a group of thirty-two farmers from the reserve lands and were followed by a further twenty-one in 1965 and yet another twenty-two in 1966 (Magande, 1975).

1.10 Conceptual framework

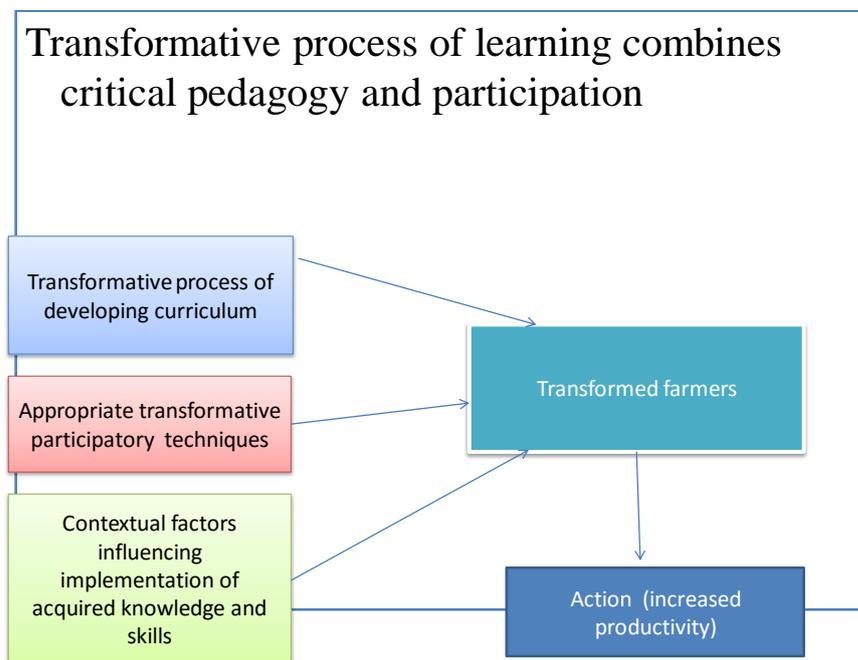


Figure1: Conceptual framework

1.11 Theoretical framework

This study was based on the transformative theory as explained by Mezirow, Boyd and Freire. Mezirow (1996) states that rational transformation is uniquely adult, abstract, idealized, and grounded in the nature of human communication. It is a theory that is partly a developmental process, but more in a learning environment it is seen as the process of using a prior interpretation to interpret a new or revised interpretation of the meaning of one's experience in order to guide future action.

Rational transformation can also be seen as instrumental learning, which focuses on learning through task-oriented or problem solving and determination of cause and effect relationships which is simply learning to do, based on the discovered knowledge. On the other hand, rational transformation is communicative learning, which is learning involved in understanding the meaning of what others communicate concerning values, ideals, feelings, moral decisions, and such concepts as freedom, justice, love, labour, autonomy, commitment and democracy (Mezirow, 1991: 8).

From the time one is born they often acquire values, habits, beliefs and norms through the process of socialization and acculturation, with peers, teachers, parents, and mentors who define various situations for them. Rational transformation is there to transform the old values, habits, beliefs and norm that people acquire from childhood and youth so as to develop a new meaning structure. This changing of values and beliefs is what is at the heart of transformation.

In order to transform the meaning structures of participants, the participants are introduced to a learning content that is directly attached to the needs of the learners and this content is not made by the facilitators and imposed on the learners, but learners participate in identifying the subject matter. Furthermore, the learning process is participatory in nature so as to allow the learners participate actively in the learning programme. Through this process learners and facilitators share equal responsibility to create new knowledge and skills as learning is done through the use of experiences as they dialogue with each other. Mezirow (1997) supports that rational discourse is a necessary medium for which transformation is promoted and developed. Mezirow (1995) suggests that learning from experiences establishes a common base from which learners construct meaning through personal reflection and group discussion.

Furthermore, critical reflection, based on Habermas' view of rationality and analysis, is considered by Mezirow the distinguishing characteristic of adult learning. Mezirow (1991) states that critical reflection is questioning the truthfulness of values and beliefs based on the previous experience, and this questioning is based on the response to an awareness of a contradiction in thoughts, feelings, and actions. In this process people engage in the process of turning their attention to the justification for what they know, feel, believe and act upon.

In addition, transformative learning theory does not end on the process but continues to suggest that the socio-cultural contextual factors that may affect the outcome of the learning programme should be taken care of. Mezirow (1997) is of the view that a full understanding of one's personal situation depends on a deeper understanding of the social, political, and cultural context in which one lives. These factors limit the way learners understand who they are as persons and communities, thereby limiting their actualisation.

Mezirow (1991, 152) suggests that development is an outcome of the transformative learning process, in that it is irreversible once completed. This means that once people's understandings are clarified and they have committed themselves fully to taking the action it suggests, they will not degenerate to levels of less understanding. This is because significant learning involves a total transformation of meaning structures through an on-going process of critical reflection, discourse, and acting on one's beliefs. It is the very logic that provides the rationale for educators to choose the best of practices for fostering transformative learning.

Robert Boyd: Transformation as Individuation

Boyd's model of transformation is grounded in the analytical (depth) psychology work of Carl Jung explored within the context of small group behaviour. Boyd sees transformation as an inner journey of individuation, which is the lifelong process of coming to understand through reflection the psychic structures (ego, shadow, persona, collective unconscious, and many others) that make up one's identity. Individuation involves the discovery of new talents, a sense of empowerment and confidence, a deeper understanding of one's inner self and greater sense of self responsibility (Boyd, 1991).

Boyd (1989, 459) states that transformation is a fundamental change in a person's personality involving conjointly the resolution of a personal dilemma and the expansion of consciousness resulting in greater personality integration. This implies that only through a transformation can significant changes occur in an individual psychosocial development.

The central purpose of a perspective transformation is to free individuals from their unconscious content and reified cultural norms and patterns that constrain the potential for self-actualization. Boyd's transformation is much more about coming to terms with the first half of a person's life and a meaningful integration with the second half. Boyd is much more focused on conflicts within the individual's psyche and the resolution among these entities that leads to a transformation.

Boyd sees the transformative journey a process of discernment which is a holistic orientation leading to contemplative insight, personal understanding of seeing life in a relational wholeness. It is indicative of three distinct activities: receptivity (listening), recognition (recognizing the need to choose), and grieving (self-talk and emotional crisis). The process is intensely personal and extra rational, focusing on the internal and subjective experience, with an emphasis on open dialogue with the Self.

Furthermore, Boyd and Myers (1988, 282) suggest that abiding within the person is a truth, a knowledge, which is not separate from socio-economic, political, and other cultural influences, but transcends them. The adult educator is encouraged to practice two virtues, each one designed to arouse the spiritual energy necessary for self-reflection in learning throughout life. The first virtue, seasoned guidance, is that of an experienced mentor reflecting on their own journey with the intent to help guide others. The second virtue is compassionate criticisms, assisting students in questioning their own reality, facilitating the process of discernment, which ultimately reveals the present and creates a path for the future.

Washburn (1988, 55) is of the view that Boyd suggests a transformation that involves coming to terms with hidden or latent aspects of person's personality, a movement from the personal, where ego consciousness is dominant (Mezirow's perspective), to the transpersonal where "the ego is a servant of the spirit." Therefore, failing to come to terms with the self, the rational side of human nature is vulnerable to the forces of the unconscious, unable to act on a new perspective.

Paulo Freire: An Emancipatory Transformation

Freire wanted people to develop a theory of existence, which views people as subjects, not objects, who are constantly reflecting and acting on the transformation of their world so it can become a more equitable and better place for all to live. This transformation, or unveiling of reality, is an on-going, never ending, and dynamic process.

Freire is much more concerned about a social transformation of the social structures of society by unveiling of reality by the oppressed through the awakening of their critical consciousness. The process that enables people who are oppressed to perceive social, political, and economic contradictions within society, and take action against the oppressive elements of reality. This awakening of people's critical consciousness is the consequence of the process of conscientisation.

Merriam and Caffarella (1998, 9) point out that Freire suggests that no education is neutral because it either domesticates by imparting the values of the dominant group so that learners assume things are right the way they are, or liberates, allowing people to critically reflect upon their world and take action to change society towards a more equitable and just vision. On the other hand, transformative learning aims at empowering people to challenge and change the existing oppressive structures seeing that it focuses on the real issues of life of the learners.

Like Mezirow, Freire also sees critical reflection as central to transformation in context to problem-posing and dialogue with other learners. Freire sees reflection as based on a rediscovery of power such that the more critically aware learners become the more they are able to transform society and subsequently their own reality. It is clearly a social experience by the very act of transformation, society is transformed. There are only two ways for humans to relate to the world, either by integration or adaptation.

Furthermore, Scott (1996) states that reflection is the continual search for new levels of interpretations with a new set of questions with the intent to critique former questions. Action happens in concert with reflection which is a process of continually looking over people's shoulders at how their actions are affecting the world. This process is known as praxis which is the moving back and forth in a critical way between reflecting and acting on the world. This process creates dissatisfaction within individuals on some aspects of their lives making them demand for change (Freire and Macedo, 1995).

In addition, dialogue is used to make learning more participatory even in the process of transformation. In the process of using dialogue the facilitator uses the participant's experiences to teach and learn. However, a group in such a learning atmosphere can only benefit if they are all open to new information and willing to be challenged and having a deep hope that change is possible. Freire (1970) states that the idea of using experiences offers an educational atmosphere that is safe and enables learners to share and discuss issues affecting

them making it the best setting for raising people's consciousness and facilitating an emancipatory transformation.

From the above discussion it can be observed that Freire's philosophy of education reflects an emancipatory perspective inherent in both a personal and social transformation of which neither can be separated. It is the combination of both the biography of the personal and that of the social that sets the stage for emancipation. Transformational learning occurs when one grasps with growing insight the way persona intersects with the social structure, and the privilege and oppression of persons based on power (Dirkx, Cunningham, Hart, Mezirow, and Scott 1993: 358). Furthermore, it is through the practice of critical reflection, problem-posing, and dialogue that transformative learning is fostered accomplishing its primary objective of democratizing the social world.

This study attempted to discover to what extent the training programme by the department of agriculture extension under the ministry of agriculture in Ngwezi settlement scheme is transformative. For the purpose of this study transformative theory as explained above will be used seeing that it helps in understanding how adult best learn to achieve the desired transformation in Ngwezi settlement scheme. For the agricultural extension programmes in Ngwezi settlement scheme to be capable of transforming the traditional farmers into commercial farmers its content has to be built around the farmers' needs and interests because what matters in transformative learning is the fact that people learn what they need to achieve social change.

Lindeman (1926) states that adult education begins at this point of specific situations of learners with respect to their work, recreation, family-life and community-life, and that the subject matter is brought into these situations when needed. This is necessary because adults learn in order to solve problems. Hence, adults avoid programmes that fail to address their needs. Knowles (1976) explains that adults are actively engaged participants in the learning process as they co-create or construct what it is they are learning as they learn.

Nonetheless, learning is dependent not only on the specific matter to be acquired but also on the ways in which learning is taking place. Adults are not like children who wait upon the teacher to tell them everything the teacher knows and take it as gospel truth. Adults want to contribute by sharing what they know on the subject matter and as such the teaching of adults needs to be participatory in nature. Dirkx (1998) suggests that learning in the process of

transformation has to be made more participatory to ensure dialogue of equals in generating knowledge.

Furthermore, for learning to be transformative in Ngwezi settlement scheme it has to help learners question their values, beliefs, habits and norms, quality and purpose as this will help them to know who they are and their relationship with the world . This process empowers learners to be more than seekers of information and solutions to problems to being active with a strong sense of urgency, to act on and often create the worlds which they inhabit. However, learners in Ngwezi settlement scheme may be constrained by personal and or socio-cultural contexts which limit or shape the way they understand who they are. Transformative learning therefore, aims at identifying the forces that may limit learners and freeing them from their coercive influence through reflection, dialogue, critique, discernment, imagination and action.

This study therefore, attempted to discover to what extent the training programme in Ngwezi settlement scheme by the department of agriculture extension is capable of transforming traditional farmers into commercial farmers or efficient farmers. Based on transformative learning theory, it is viewed that answers to whether the training programme in Ngwezi settlement scheme is transformative will be given. This is because according to the above discussion transformative learning will only take place when the content and the processes of learning are grounded within the lives of those the learning programme is designed for, and also within the socio-cultural context in which those lives are embedded.

1.12 Operational definitions of terms

Agricultural extension	Agricultural services provided to farmers on how to improve their productivity through teaching and research.
Transformative learning	A kind of education that helps people to change the way they interact with other and the environment.
Training programme	A significant long-term training activity which comprises of a series of courses designed for training employees in specific skill.
Indigenous Knowledge	Indigenous people know and do, and what they have known and done for generations to cope with change.

Settlement scheme	Farming areas set up by the government for agricultural purposes
Lead Farmers	Disseminate information and technologies to local farmers.
Follower Farmers	Local farmers organised in groups to form farmer field schools.
Poverty	The lack of physical necessities, assets and income.
Extension officers	Facilitate dissemination of information and technologies for improved agriculture.

1.13 Organization of the study

This chapter of the study has presented the introduction to the study. The literature review is presented in chapter two. This chapter has attempted to give a background on agricultural extension and settlement schemes in Zambia. Chapter three provides the methodology which was employed in conducting this study. It describes the research design, population and sample, and data collection procedure. Chapter four presents the findings of the study and chapter five presents the discussion of the findings of the study. Finally chapter six presents the conclusion and recommendations of the study.

1.14 Summary

This chapter focused on background information on agricultural extension in Zambia. Among several issues presented include the statement of the problem, objectives of the study, limitations and significance of the study. The agricultural extension has been discussed in the context of the developments that have taken place in the Ministry of Agriculture in Zambia. The mandate to provide, coordinate, manage and monitor agricultural extension in the country is under this Ministry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature related to transformative learning. It begins by providing a profile of Ngwezi settlement scheme of Mazabuka District. The literature is reviewed under the following themes: productivity and efficiency, participation, agricultural extension, transformative learning, the process of developing a transformative curriculum, the instructional methods in transformative learning and lastly the contextual factors that influence transformation.

2.2 Profile of Ngwezi settlement scheme

The Ngwezi settlement scheme is located along the Ngwezi River plain which runs from the Magoye area eastwards for over thirty miles. The area is close to the railway line running from Livingstone to the north with Magoye siding less than two miles away from the western end of the scheme. The area is bounded by a district road on the southern end dividing it from the reserve and to the north. There are also a few large commercial farmers and the Magoye Regional Research station.

Magande (1975) illustrates that the Ngwezi settlement scheme was an effort by the government to provide the peasant farmers with basic services and introduce them to commercial farming. The main objectives of the scheme were to:

1. Reduce over-crowding in the surrounding districts.
2. Provide information on settlement for future agricultural planning.
3. Develop commercial farming on small farms.
4. Teach modern methods of farming which will increase the production of the small-scale farmer and thus raise the standard of living of the family.

The farmers that settled on the scheme were chosen from a long list of applicants drawn from the surrounding areas. The main qualities looked for were that the applicants have experience as farmers and owned some equipment to enable them use the land agriculturally.

2.3 The concept of Participation

Economic and Social Department (2005) regards participation as an iterative process which develops and occurs over a significant period of time. The concept of participation cannot be developed or implemented over night or within a short period of transformative learning. Participation is a process which requires patience and commitment from all; it is a process which requires stakeholder courage in order to recognise and admit when things go wrong. In the participatory process it is important to revisit agreements and decisions periodically to adjust them for changes which might have occurred in the respective situations or conditions of the various groups. Stoker (1997: 157) defines participation as “members of the public taking part in any of the processes of formulation, passage and implementation of public policies”. Cheruiyot (2012) suggests that participation of adult learners is very important for the successful development, implementation and evaluation of programmes because their views, suggestions and requests need to be integrated in the development of the programmes in order to raise their level of motivation and confidence with which to participate in the programmes.

The table below shows the different levels of participation according to Adnan et al (1992). The levels of participation provide the way of measuring the quality of participation because by examining the level at which a particular form of participation occurs the level can be located whether it is at low or high level.

Table 1: Levels of participation

Passive Participation
Participation in Information Giving
Participation by Consultation
Participation for Material Incentive
Functional Participation
Interactive Participation
Self-Mobilization

Source: Pretty (1994), adapted from Adnan et al. (1992).

2.4 The concept of Productivity and Efficiency

Odhiambo and Nyangito (2003) did a study on measuring and analysing agricultural productivity in Kenya and they stated that efficiency and productivity were closely related in that changes in productivity are due to differences in production technology, differences in the efficiency of the production process, and differences in the environment in which production takes place. On the other hand Chiona (2011) suggests that productivity and efficiency are two different concepts except under the assumption of constant returns to scale. Technical efficiency of a producer is a comparison between observed and optimal values of its outputs and inputs. This can be done either from the output side or input side. On the output side observed output is compared to potential output obtainable from the inputs while from the input angle observed input levels are compared to minimum potential input required to produce the output. In either perspective, the optimum is defined in terms of production possibilities.

Latruffe (2010) suggests a general definition of productivity which is the ability of production factors to produce the output. It can be simply measured as a partial productivity indicator, relating output to one input for example yields or partial productivity of labour, but this does not account for the possibility of either factor substitution or output substitution.

Yeboah, Gunden, Shaik, Allen and Li (2011) argue that the efficiency of a production unit involves the comparison between observed and optimal amount of its output and input and that technical efficiency is the ability of obtaining maximum output by using a certain amount of input. They suggested two approaches for measuring efficiency which are input oriented approach which measures technical inefficiency as proportional increase in input use keeping output constant; and technical inefficiency which can be measured as a proportional increase in output keeping input use constant (output-oriented approach).

Fried et al. (2008) state that productivity of a producer is the ratio of its output to its inputs and its measure is easy to calculate if a producer uses a single input to produce a single output. But when multiple inputs are used to produce several outputs, the outputs in the numerator and inputs in the denominator have to be combined in some economically sensible fashion, so that productivity remains the ratio of two scalars. Differences in production technology scale of operation, operating efficiency and the operating environment in which

production occurs are the most common causes of variations in productivity either across producers or through time.

For this study productivity is the measure of efficiency of farmers in converting inputs into useful outputs. This helps in determining if farmers are using resources more efficiently by applying best technological and managerial practices from agricultural extension programmes. Whereas efficiency is the ratio of output to input, it is the ability to avoid wasting materials, money and time in producing farm products.

2.5 Agricultural extension

Government of India planning commission (2012: 17) defined agricultural extension as the application of scientific research and knowledge to agricultural practices by farmers through the delivery of information inputs by extension officers. The agricultural extension services provide for teaching farmers how to improve their productivity through moving research from the lab to the field and to ensure a return on investment in research by translating new knowledge into innovative practices.

Oladele, Lepetu, Subairand Obuh (2009) suggest that majority of people in southern Africa countries such as Lesotho, Malawi, Mozambique, Swaziland, Zambia, and Zimbabwe are vulnerable to food insecurity due food shortages, and declining agricultural productivity and they concluded this was due to poor extension services to farmers. Oladele and Sakagami (2004) explain that agricultural extension programmes are very diverse from an international perspective as most are managed as public sector agencies and some non-governmental organizations.

The table below shows the different conservation agricultural methods being practiced in some African countries which are taught to farmers.

Table 2: Different methods of CA practiced in some African countries

Country	Basins	Ripping	Direct seeding
Malawi	✓		✓
Lesotho	✓		✓
South Africa			✓
Madagascar			✓
Zimbabwe	✓	✓	✓
Angola			✓
Zambia	✓	✓	✓
Mozambique	✓	✓	✓

Source: Analysis of the Status and Potential of Conservation Agriculture in Southern Africa: FAO-REOSA Network Paper (forthcoming).

FAO (2010) illustrates that compared to other regions Africa is still lagging behind in the extent of CA practice. The table below shows the adoption levels of conservation agriculture (CA) of some of the African countries. South Africa is practicing one method of CA and is doing far much better as compared to Zimbabwe, Zambia and Mozambique who are practicing all the 3 methods of CA.

Table 3: Estimated areas (ha) under CA for some African countries

Country	Areas under CA (ha)
South Africa	368 000
Zambia	40 000
Ghana	30 000
Kenya	15 000
Sudan	10 000
Mozambique	9 000
Zimbabwe	7 500
Tanzania	6 000
Morocco	4 000

Source: Derpsch et al., (2010)

Sichula (2012) indicates that agriculture extension is a form of adult education whose focus is on imparting knowledge and skills to the farmers through provision of adult education programmes which are agricultural related. These programmes are conducted through the provision of agriculture extension education.

Nonetheless, Bonaglia (2008) states that in Zambia the Ministry of Agriculture (MA) is delegated responsibility for policy formulation, enforcement of legislation, regulation and inspection, maintenance of the strategic food reserves, provision of market information, financing the control of pests and diseases of national economic importance, and monitoring and evaluating overall sector performance. MA is also charged with developing partnerships with the private sector for service delivery, including extension and research.

MEAS (2014) indicates that the Ministry of Agriculture (MA) is by far the largest extension provider in the country which implements a nationwide extension program through a large cadre of field-based Camp Extension Officers. Its extension program is informed by and designed to advance the Ministry's overall mission and vision, which are:

MAL (2013) explains that the MAL's mission is "to facilitate and support a viable and competitive agriculture sector that assures food security and incomes at both household and national levels and maximizes the sector's contribution to Gross Domestic Product (GDP)." The vision for the agriculture sector is to have "an efficient, dynamic, competitive, sustainable and export-led agriculture sector that assures food security and increased income by 2030."

Chunga (2007) states that the overall outcome of agricultural extension is capacity building in individual farmers, farming and rural communities. Furthermore, MAL (2013) states that extension services delivery provided by the Ministry of Agriculture aims at achieving capacity building among target farmers based on four main paradigms of technology transfer, problem solving, education, and human development. MEAS (2014) illustrates that the Ministry has a total of 346 Agricultural Blocks, which are demarcated into 1,757 Agricultural Camps around the country, which are currently at Seventy-Six (76) percent staffing level.

Nevertheless, Oladele, Lepetu, Subairand Obuh (2009) outline the organizational structure in MAL's Department of Agriculture as follows; the Ministry of Agriculture and Cooperatives is headed by a Permanent Secretary at the national level who is supported by Directors, Deputy and Chief Agricultural Officers. At the Provincial level, the Provincial Agricultural

Coordinator is the head of the organisation. He coordinates Agriculture Extension, Research, Planning Marketing, and Veterinary departments. The Heads of these Departments are called Provincial Subject Matter Specialist. At the District level, the District Agricultural Coordinator (DACO) heads the Organisation, Coordinating the following Sub-programmes: Marketing and Cooperatives, Technical Services Branch, Fisheries, National Agricultural Information Service and Extension. The Head of the Department of Agriculture at District level is the Senior Agricultural Officer, under which the extension sub-programme falls, and it is headed by the Extension Methodologist. In the field, there are Block Extension Officers, Camp Officer, and farmers.

Kodamaya (2011) in MAL (2013) suggests that Zambia has experienced several phases of policy changes that affected the agriculture sector starting from market economy from independence in 1964 to the early 1970s, then a state controlled economy from the early 1970s to the mid-1980s, followed by structural adjustment programs before returning to an introduction of neo-liberal policies in the 1990s. After 1991, Government of the Republic of Zambia (GRZ) implemented economic liberalization and de-regulation policies such as the privatization of state enterprises and liberalization of agricultural markets and trade. From 2001 to 2008 the “New Deal” administration recorded economic growth with agriculture as the centre of Zambia’s development and poverty reduction as the main goal.

World Bank(2010) states that some policy changes were later introduced including the government involvement in maize marketing and re-introducing fertilizer subsidies. The government expanded the role of the Food Reserve Agency (FRA) by making it a de facto marketing board and playing the role of importing fertilizer and distributing supplies to smallholder farmers until 2002, when the Fertilizer Support Program was launched.

MAL (2013) states that the current major guiding document of the agriculture sector in Zambia is the Sixth National Development Plan (SNDP) 2011–2015 and its main objective is to renew the Vision 2030’s goal for “a prosperous middle-income nation by 2030”. The SNDP amongst others defines Agriculture, Livestock and Fisheries as main priority growth sectors together with Mining, Tourism, Manufacturing and Commerce and Trade.

In summary agricultural extension remains an academic endeavour unless it is informed by real problems on the ground and efforts are made to deliver solutions to farmers by

appropriate forms of extension. For this study, agricultural extension are all agricultural services provided to teaching farmers how to improve their productivity through research.

2.6 Transformative learning

Mezirow (1996, 162) states that transformative learning offers a theory of learning that is uniquely adult, abstract, idealized, and grounded in the nature of human communication. It is a theory that is partly a developmental process, but more as learning is understood as the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one's experience in order to guide future action.

Transformative learning theory is founded on both humanist and constructivist assumptions. From a psychological perspective, humanism presupposes that human nature is intrinsically good and that humans are free and autonomous beings. The emphasis is on the self; the self has the potential for growth, development, and self-actualization, which, in turn contributes to the good of humanity in general (Merriam and Brockett, 1997). Moore (2005) illustrates that constructivism comes from the work of Piaget (1952), Dewey (1938) and Candy (1991) self-directed learning. Constructivism describes learning as a process of creating meaning from experience both by individuals and groups.

Transformative learning is learning that transforms problematic frames of reference...sets of fixed assumptions and expectations (habits of mind, meaning perspectives, mindsets)... to make them more inclusive, discriminating, open, reflective, and emotionally able to change. Such frames of reference are better than others because they are more likely to generate beliefs and opinions that will prove more true or justified to guide action (Mezirow, 2003, 58-59).

Mezirow (1997, 5) defines frames of reference as the structures of assumptions through which people understand their experiences. They selectively shape and delimit expectations, perceptions, cognition, and feelings. The frames of reference influence the actions and behaviours of people, this is because the changed frames of reference will determine the new behaviour of people (Cranton, 1994). Transformative learning therefore, is learning that transforms problematic frames of reference which can be seen as sets of fixed assumptions and expectations (habits of mind, meaning perspectives, mind sets) so as to make them more inclusive, discriminating, open, reflective, and emotionally able to change.

Kegan and Lahey (2009, 51) state that transformative learning is the process of transforming people's meaning making so that the way they make meaning becomes a kind of tool that people have rather than something that has people. It is the process of gaining successively more complex ways of knowing that defines transformative learning, a process that draws on head and heart, on thinking and feeling.

Nonetheless, Sullivan (2003, 326) defines transformative learning as experiencing a deep, structural shift in the basic premises of thought, feelings, and action. It is a shift of consciousness that dramatically and irreversibly alters our way of being in the world. Such a shift involves our understanding of who we are and our self-locations; our relationships with other human and with the natural world; our understanding of relations of power in interlocking structures of class, races, and gender; our body awareness, our visions of alternative approaches to living; and our sense of possibilities for social justice and peace and personal joy.

Brown and Posner (2001) suggest that transformative learning is the process of construing and appropriating a new or revised interpretation of meaning of one's experience as a guide to action and hence, through transformative learning learners transform the way they perceive and understand things and thus generate new ways of interpreting them. Mezirow (1981) defined meaning perspectives as a person's overall world-view, and defined meaning schemes as smaller components which contain specific knowledge, values, and beliefs about a person's experiences. From this it can be argued that a number of meaning schemes work together to generate a person's meaning perspective and changing these is the goal of transformation.

Furthermore, Cranton (1992) suggests a framework of three types of change that are indicative of transformation in people and these include change in assumptions, change in perspective, and change in behaviour. When people are involved in a learning experience they take with them their old experiences that they acquired in life, and transformation will only be seen when people change the way they interpret life experiences which will be evidently observed through the changed actions. On the other hand, Boyd (1989) states that an outcome of transformative learning includes a change in self. For as long as there is change in behaviour or theories in use transformation has taken place. Hence, Mbozi (2000) explains that transformation learning theory are bounded together by the argument that

individual learners have the potential to learn but at times this learning does not occur as expected because would-be learners have distorted perceptions of the world.

From the above definitions it can be concluded that transformative learning is the process of changing individual's old ways of interpreting and viewing the world. For this study therefore, transformative learning is the process of changing people's assumptions, perspective and behaviour through the process of awakening individuals to their realities to enable them generate new ways of interpreting their life experiences and take action. It is any learning that empowers individuals to take action to change the conditions that dehumanise them.

2.6 The process of developing a transformative curriculum

Kimwaga (2010) states that like other human societies across the globe, African indigenous societies have, for centuries, developed their own sets of experiences and explanations relating to the environments they live in. This is due to the fact that the way learning is perceived and how people actually learn is culturally specific. Seeing that different cultures have different ways and experiences of social reality their learning is also different. Matike (2008) explains that culture is not a static set of customs, religious beliefs, social attitudes, forms of address and attire, and foods, rather, it is a dynamic process of transformation and change laden with conflicts to resolve and choices to be made both individually and as a community.

Further still, Sarpong (2002) argues that knowledge or science, and its methods of investigation, cannot be divorced from a people's history, cultural context and worldview. This is because worldview shapes consciousness and forms the theoretical framework within which knowledge is sought, critiqued and or understood. Nsamenang and Tchombe (2011) indicate that any education for sustainable development in Africa is incomplete without an account of the indigenous patterns of education that existed prior to the intrusions of Islamic-Arabic and Western-Christian educational heritages. This is because African education has survived invasive colonial and neo-colonial forces for centuries now and have continued to be useful and have not entirely yielded to abrasive colonial efforts and waves of post-colonial interventions to eradicate them. Therefore, any relevant educational efforts in Africa in this era should begin with at least a brief reconstruction of the key features of these three intertwined significant educational heritages that have coexisted in Africa.

Melchias (2001) explains that a bright future for African education is promised in not continuing with fixated adherence to Eurocentric curricular ideals, but in designing generative curricula, not in isolation but in the light of global trends in educative sciences. The aim of generative education is to secure African cultural identity and to teach African knowledge bases, complementing them with productive techno-cognitive contents and responsible values. The intention of this is to open up educators to new ways of looking at and valuing Africa by them seeing value in and appreciate Africanity.

Moreover, Freire (1990) suggests that relevant generative themes should be used in adult education seeing that the aim of education is radical transformation as people are all called upon to transform their own personal lives, community, environment and the whole society. Ball and Pence (2006) state that a generative curriculum starts and develops on the interests of learners and also facilitators interests to some degree and these interests remain at the centre of teaching and learning. As adult learners and facilitators pursue areas of interest, new knowledge is generated and new curricular content is created collaboratively. Thus, learning becomes dynamic, as an avenue of interest leads to another. As themes and topics are initiated and actively pursued, connections and relationships are made between these identified issues. Freire (1999) explains that these issues surface people's emotions and generate some energy and hope for action towards emancipation.

It is because working with learning contents in such a way allows for authentic learning to take place and provides facilitators with opportunities to become learners as well. In this way educators become learners who teach and the learners become knowledge generators with educators as facilitators. In this way, a generative curriculum in general is not only for life-long learning but also life time generation of knowledge. Thus, in using generative themes, it is expected that teaching-learning transactions will proceed in ways that renew knowledge and skills, inspire insights and new visions and generate authentic knowledge in shared processes.

Furthermore, Nsamenang and Tchombe (2011) illustrate that generative education provides rich opportunities for inquiry based learning. The learners take ownership by pursuing their interests and in so doing discover and develop their potentials, passions and talents. As life-long learners and deep, critical thinkers, they are able to make significant contributions whose meaningfulness they can demonstrate in their eco-cultures that are part of a complex and changing world. Generative inquiry embodies an underlying belief in adult learners as

learners whose natural curiosity leads them to explore their world in meaningful ways. Freire (1999) argues that a generative approach is perspective not a method as it is a way of viewing teaching and learning that respects the fact that each participant comes to the learning environment with varied interests, skills and knowledge of the world.

Goodman (1985) states that within this frame of organizing curricular inputs participants are expected to consult with holders of indigenous knowledge in their own communities, and bring this information into the learning curriculum. As such, the generative approach to adult curriculum provides an effective framework for incorporating local knowledge into andragogic processes, policy, and research in order to sustain useful facets of culture and promote the community's development.

Ball and Pence (2006) explain that the generative theme approach shifts away from affirm search for a universal educational approach to a celebration of the reality and richness of diversity in educational ideas and practices. By bringing together the needs of the learners and community and blending them into a curriculum opens a door to developing culturally specific understandings of educational ideas and practices and the educational needs of Africa's ethnically diverse communities. It also has the potential to uncover and focus on elements of the social ecology of Africa's adults, how community members see those elements, and their perceptions of the implications of these elements for adult education.

On the other hand Lindeman (1926) suggests that adult education takes place in relation to concrete situations and these are always educational situations, not subjects. Also the objective of adult education is to further the process of development and growth (of individuals and the human species alike), content being only a means to furthering this process. This is because the purpose is to put meaning into the whole of life. In adult education the curriculum is built around the student's needs and interests.

This is because every adult person finds himself in specific situations with respect to his work, his recreation, his family-life, his community-life and these may provide situations which call for adjustments. Adult education begins at this point and the subject matter is brought into the situation, is put to work, when needed. Freire (1999) explains that texts and educators play a new and secondary role in this type of education for they must give way to the primary importance of the learner. The situation-approach to education means that the

learning process is at the outset given a setting of reality thus, intelligence performs its functions in relation to actualities, not abstractions.

From the above argument it can be seen that according to Lindeman the motivation for adult learners is located in the learners because they have needs they want to meet. So these needs make adults to attend the learning programmes. Adults do not come to the learning environment because they want to acquire certificates or pass exams this is because their motivation is intrinsic, they want to solve a pressing problem.

Knowles (1976) provides six principles of adult education and among the six is the principle of adult learners being internally motivated and self-directed. Rockhill (1987) states that adults feel motivated to learn if they want to satisfy certain needs. In principle, adults learn in order to maintain or establish social, personal interests to advance their career. Therefore, adult learners resist learning when they feel others are imposing information, ideas or actions on them.

Adults are ready to learn those things they consider to be worthwhile and adults learn best when the subject matter being taught is of real use to them in their daily lives. Brookfield (1987) observes that adult learners want to know the relevancy of what they are learning in relation to what they want to achieve in life. It is therefore, that all subjects taught and discussed in adult education are related to adult participants as farmers, home makers, workers, or citizens.

The content of adult education therefore, is aimed at addressing the pressing problems that participants face seeing that they are goal oriented. This is to suggest that adult education is need-based as it aims at meeting the needs of the learners in the learning programme who are key players in national development. Knowles (1980) is of the view that adults learn in order to cope with real life problems in a more satisfying way. In this paradigm, adults in a farming community, for example, will engage in learning with the intent of improving crop yields or fighting challenges such as army worms that are threatening destruction of crops leading to a loss.

In summary the content of transformative learning aims at meeting the needs of the participants in their respective communities. The content has to reflect the real needs of the learners so as to help learners solve their problems. In making the content transformative the culture, generative themes and situations of the learners should be taken into consideration.

2.7 The instructional techniques in transformative learning

Mezirow's theory of transformational learning in the learning environment suggests that participatory methods should be used in teaching adults and he suggests experience, critical reflection, and rational discourse to facilitate transformative learning (Mezirow, 1991).

2.7.1 Experience

Taylor and Cranton (2013) explain that a concept that is most central to transformative learning and adult learning in general is experience which is prior experience. It is the primary medium of a transformation, and it is the revision of the meaning of experience that is the essence of learning. It is experience that forms the basis for habitual expectations (ideologies, beliefs, values), creating the lens from which learners perceive, interpret and make meaning of their world in the learning process (Mezirow, 1991).

Mezirow (2000) suggests that experience constitutes a starting point for discourse which leads to critical examination of normative assumptions underpinning the learner's ... value judgments or normative expectations' as such in concert with dialogue and self-reflection, it is the core substance of transformation. Taylor and Cranton (2013) argue that despite the centrality of experience to transformative learning theory it is rarely defined or critically examined in research about transformative learning as to state what constitutes an experience, what gives meaning to an experience and what distinguishes a transformative experience from other types of experiences. This is because Dewey (1981), for example, used experience to suggest in summary all that is distinctly classified as human. This view does not guide on what kinds of experiences should be considered in the transformative learning process.

Nonetheless, Mezirow (1991) states that it is the learner's life experiences that provide a starting point for transformative learning in adult education. Lindeman (1961) sees experience as adult learner's living textbook which should be used in the learning process to make learning more meaningful as it is the resource of highest value in adult education. Experience is taken to be the stuff out of which education is grown, and this is because learners bring the richness and diversity of their lives with them. It is important therefore, that learners be given an opportunity to use their existing knowledge and experience, which they can apply to the new learning experiences. As Jarvis (2005, 72) defines experience to be the process of creating an understanding of or perception of a situation, which often appears to be

a direct participation in an event, and the accumulation of previous experiences, both conscious and unconscious, and stored in the mind.

Additionally, MacKeracher (2012) identifies two types of experiences which are those that individuals experience directly and those imposed through cultural and social heritage and explained that there is a need to distinguish experiences ‘that individual’s minds have made sense of and given meaning to from those that languish unattended and senseless in people’s unconscious mind waiting for their further attention. Moreover, Fenwick (2000) gives a more comprehensive perspective of experience which embraces the reflective as well as kinaesthetic activity, conscious and unconscious dynamic, and all manner of interactions among subjects, texts, and contexts. Nohl (2009) explains that it is important to recognise, acknowledge and appreciate the context of an experience as critical for transformative learning to take place and this will help to understand what a transformative experience is.

Dirkx (1998) states that past educational or work experiences may colour or bias the learner’s perceived ideas about how education will occur in a learning environment. If successfully guided by the facilitator, former experiences can assist the adult to connect the current learning experience to something learned in the past. This may also facilitate in making the learning experience more meaningful. However, past experiences may actually make the task harder if these biases are not recognized as being present by the educator.

In summary experience for this study is everything that is important that happened to a learner between birth and death to current learning process which needs to be used. The use of experience helps with retention of information, enjoyment of learning and encouragement to become a master at what is being learnt.

2.7.2 Reflection

Usher, Bryant and Johnston (1997) suggest that reflection is a practice that facilitates the exploration, examination and understanding of what people are feeling, thinking and learning in their everyday life. It is a thoughtful consideration of academic material, experiences and interpersonal relationships by an individual. Reflection is a form of internal inquiry in individuals that extends the relevance of theory and deepens people’s understanding of the practice of their everyday life and work.

Smith (1994) argues that reflective learning involves students thinking about what they have read, done, or learned, relating the lesson at hand to their own lives, and making meaning out of the material presented to them. Reflective learning helps learners not to passively receive external expert knowledge, instead become active creators (and co-creators) of their own knowledge. As reflective learners they test their informal theories (those that they develop through their experiences as practitioners in the world) against formal theories (those that are developed by researchers and academics).

Nonetheless, Dewey wrote intensively on the concept of reflection and he specifically argues that thinking starts with the reflection of sensory inputs (experiences) against some concept or situation (Dewey, 1910). Dewey (1910) illustrates that reflection was a necessary precursor for action, this is because he suggested that for people to be able to act they should have thought about what they wanted to do. In other words, Dewey advocated that for students to effectively apply the knowledge and skills they had acquired they really had to think and mull over what they had read and encountered. Dewey sees reflection as a preoccupation or as dwelling upon things that puzzle or disturb people, and sees reflection as a kind of activity that takes place first before one can act.

Dewey (1933: 118) defined reflective thought as ‘active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends’. Dewey’s reflective thinking means that, when people encounter a problem, their intuitive concepts will immediately suggest a solution. Intuitive concepts are thought to be similar to schemas, patterns, mental models, or automatic thinking as discussed in the psychological literature (Eraut, 1994). If this intuitive solution becomes untenable, then another intuitive solution will need to take its place and then the explicit concepts reflection process starts again.

Nonetheless, Schon studied Dewey and he concluded with two types of reflection which are; reflection-on-action and reflection-in-action. Schon (1987) states that reflection-in-action is sometimes described as thinking on peoples’ feet. It involves looking to people’s experiences, connecting with their feelings, and attending to their theories in use which are the values, beliefs and norms that people have acquired over a period of time. Reflection-in-action entails building new understandings to inform people’s action in the situation that is unfolding to them.

However, when an unusual, unexpected or complex situation takes place in a person's life, almost by definition, intuitive reflection no longer suffices, and there is need to recognise the switch to using explicit concepts reflection, or reflection-on-action as Schon calls it. Argyris and Schon (1974) suggest that this necessarily comes distinctively after the action. In addition, Smith (1994) indicates that technical reflection, which involves evaluation of the adequacy of skills and capabilities used for a particular task, usually takes place immediately after the event when the consequences are known and that higher levels of reflection take place later. Continued reflection over a prolonged period of time after the action has taken place helps to ensure that alternatives to the action taken are fully explored and investigated.

Argyris and Schon (1978) suggest that reflective learning is about testing out people's theories in use and this allows for the development of further responses and moves. Schell and Black (1997) point out that the act of reflecting-on-action enables people to spend time exploring why they acted as they did, what was happening in a group and so on. In so doing people develop sets of questions and ideas about their activities and practice. Learners therefore, through the process of reflection get to question their activities and practices of everyday experiences.

Kolb (1984) states that reflection leads to a new idea or modification of an existing one and that the development of new concepts is provided by new experiences. In addition, Kolb (1981) suggests that reflection is the process of reviewing and questioning the experiences in order to reach a conclusion. Through this process learning takes place since knowledge is created through the transformation of experiences. Nevertheless, Mezirow (1991) states that reflection involves a critique of values and norms to determine whether the beliefs, often acquired through socialisation and cultural assimilation in childhood and youth, remain functional for adulthood. In this way people question the values, beliefs and norms that they acquired from society since childhood.

2.7.3 Critical Reflection

Critical reflection, which is the careful questioning of practices, issues, and assumptions embedded within a discipline, is an important aspect of transformative learning. When learners begin to raise questions about discourse, practice, pedagogy, society, and policies, it is evident that they have experienced transformative learning. Transformative theory suggests that learners be engaged in social critique and in the interrogation of meaning in order to foster critical consciousness (Aronowitz and Giroux, 1993 in Ukpokodu, 2007).

Mezirow (2000) explains that transformative learning involves becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation, or transforming one's frames of reference. Cranton (2006) indicates that questioning develops a constructive process appropriate for fostering transformative learning and that there are three types of questioning which are content, process, premise ...that can be effective in prompting the reflective process necessary as part of a transformative experience, and then conceives of the types as connected to developing reflection concerning one's habits of mind or kinds of knowledge.

Mezirow considered critical reflection to be the distinguishing characteristic of adult learning, and saw it as the vehicle by which one questions the validity of his world-view. Boyd and Myers in Imel (1998) encouraged adult educators to develop and practice seasoned guidance which is the ability to serve as an experienced mentor by reflecting on one's journey, with the intent to assisting others with their transformational process. Also that educators value compassionate criticism, assisting students to question their own reality in ways that would promote transformation of their world view.

Additionally, Cranton (2002) states that critical reflection is the means by which people work through beliefs and assumptions, assessing their validity in the light of new experiences or knowledge, considering their sources, and examining underlying premises. As earlier discussed people through the process of socialisation acquire values, beliefs and norms which influence the way people view and analyse things and critical reflection is aimed at changing these premises. Moreover, Cranton (1994) explains that transformative learning theory leads people to view learning as a process of becoming aware of one's assumptions and revising these assumptions for the development of an individual. As he simply states that if basic assumptions are not challenged, change will not take place. Sokol and Cranton (1998) further explain that as transformative learners, they question their perspectives, open up new ways of looking at their practice, revise their views, and act based on new perspectives.

Furthermore, Burbules and Berk (1999) indicate that critical thinking is best suited for recognizing faulty arguments, assumptions lacking evidence, and obscure concepts so as to reach a new understanding of situations. It can be argued that critical reflection attempts to deconstruct the learner's prior world view such as beliefs, value systems, attitudes, and social emotion in a rational way. Moreover, Mezirow (1991) points out that learners need to reflect critically on their experiences for this will lead to transformation of meaning perspectives and

thus, transforming how people view the world as this is the goal of transformative learning. It is the process of becoming critically aware of how and why people's values constrain the way they perceive, understand, and feel about their world. This critical reflection on values then changes the theories in use which limits the learners and makes possible a more inclusive, discriminating, and integrating way of viewing the world and makes learners choose or otherwise act upon these new understandings.

In summary people become critically reflective when they question and challenge their established and habitual patterns of expectation, the meaning perspectives with which they make sense out of the encounters with the world, others, and themselves. Whereas reflection involves the assessment of the assumption implicit in beliefs, including beliefs about how to solve problems, there is a special class of assumptions with which reflection has to deal with that are quite different from these procedural considerations. Critical reflection for this study will be reserved to refer to challenging the validity of beliefs, assumptions, pre-suppositions in prior and current learning to take action for transformation.

2.7.4 Rational discourse

Rational discourse is the last instructional method to be discussed and learners need to be assisted to participate effectively in discourse. Freire (1973) suggests that dialogue is crucial in every aspect of participatory learning and in the whole process of transformation. Discourse is necessary to validate what and how one understands and arrives at a best judgment regarding a belief or assumption. In this sense, learning is a social process, and discourse becomes central to making meaning. Mezirow (2003) explains that effective discourse depends on how well the educator is able to create a situation in which those participating have full information, are free from coercion, have equal opportunity to assume the various roles of discourse (to advance beliefs, challenge, defend, explain, assess evidence, and judge arguments), become critically reflective of assumptions, are empathic and open to other perspectives, are willing to listen and to search for common ground or a synthesis of different points of view, and can make a tentative best judgment to guide action.

Cranton (1994) suggests that the educator serves as a facilitator or provocateur, in order to foster the self-direction and control needed for transformative learning. The role of the educator or faculty developer in transformative learning processes changes from that of a directive expert by shifting power, responsibility, and decision-making to the faculty. Further

still, Freire (1970) explains that the facilitator has to create a conducive environment in which true dialogue can take place. As dialogue requires patience, humility and a real belief that there is something one is able to learn from the other person. Mezirow (1991) indicates that transformative learning requires a form of education very different from that commonly associated with children because adult education is sensitive to the needs of learners.

To become meaningful, learning requires that new information be incorporated by the learner into an already well-developed symbolic frame of reference, an active process involving thought, feelings, and disposition. The learner may also have to be helped to transform his or her frame of reference to fully understand the experience. Educators must assume responsibility for setting objectives that explicitly include autonomous thinking and recognize that this requires experiences designed to foster critical reflectivity and experience in discourse.

Further still, Cranton (1994) demonstrates that education that fosters critically reflective thought, imaginative problem posing, and discourse is learner-centred, participatory, and interactive, and it involves group deliberation and group problem solving. The learners are at the centre of their learning as they are not passive receivers of information but are co-creators of their knowledge. Instructional materials reflect the real-life experiences of the learners and are designed to foster participation in small-group discussion to assess reasons, examine evidence, and arrive at a reflective judgment.

Nonetheless, Mezirow (1997) emphasizes that transformative learning is rooted in the way human beings communicate, and through the combination of reflection and discourse, learners are able to make shifts in their world view which produce a more inclusive world-view. Furthermore, Habermas (1984) states that communicative action is individual action designed to promote common understanding in a group and to promote cooperation, as opposed to and not to achieve one's personal goals. In communicative action two or more actors establish a relationship and seek to reach a common understanding about the action or and situation and their plans of action in order to coordinate their actions by way of agreement.

Freire (1973) suggests that dialogue is a process of an individual questioning the ideas that are presented before him or her and also them presenting their own ideas after a critical reflection on those ideas. Dialogue gives people an opportunity to view out or explain their

position on issues so that they are understood, without any fear and are assured that others are listening to them and appreciating their point of view. In addition, dialogue gives opportunity to individuals to hear the options of other people besides their own. Through shared experiences in dialogue adult learners acquire something that they did not have seeing that they have an opportunity to learn from others. Moreover, dialogue does not always involve a critical interaction with another person because a person can have dialogue with written texts (books).

Dialogue is at the centre of adult learning process as it is a dialogue of equals and through this social process knowledge and learning are generated (Freire and Macedo, 1995). Through the use of dialogue participants learn from each other's experiences and also the educator is given opportunity to learn from the participants. Both the adult facilitators and participants become equal as they generate new knowledge and skills and no one is taken to be the custodian of knowledge. Hence, through this process people learn to participate freely, something that can translate beyond the educational setting, for the purpose of transforming society. Freire (1973) supports by describing dialogue as an "I-thou relationship between two subjects" in which both parties confront each other as knowledgeable equals in a situation of genuine two-way communication. This is because educators possess knowledge of reading and writing whereas students possess knowledge of the concrete reality of their culture.

Furthermore, Wallerstein (1983) argues that for dialogue to be effective the facilitator needs to use the problem posing approach which utilises cultural themes in the form of open-ended problems. These open-ended problems are incorporated into learning materials in form of pictures, comics, short stories, songs, and video dramas, which are then used to generate discussion. The facilitator should ask a series of open-ended questions about these materials that encourage adult learners to elaborate upon what they see in them. Ultimately, this questioning process leads the participants to define the real-life problem being represented, discuss its causes, and propose actions that can be taken to solve it.

In summary transformative learning can be achieved through discussion and exploration of concepts relating to the life experiences of the learners. The key idea is to help the learners actively engage the concepts presented in the context of their own lives and collectively critically assess the justification of new knowledge presented.

2.8 Contextual factors influencing transformative learning

A full understanding of one's personal situation depends on a deeper understanding of the social, political, and cultural context in which one lives. In other words, in order to foster transformative learning people must understand the self of the learner in context as learning is dependent not only on the specific subject matter to be acquired but also on the ways in which the social context informs and influences how people come to define the meaning and nature of the content (Lindeman, 1926).

Mezirow (1997) suggests that actualisation is constrained by the presence of coercive forces or factors within people's personal and socio-cultural contexts. These forces limit or shape the ways in which people come to understand who they are as persons and communities and what might be their best interests. In effect, they constrain the degree to which people can be who or what they are. Transformative learning therefore, aims at identifying these forces and freeing participants from their coercive influence through reflection, dialogue, critique, discernment, imagination and action.

Swanson, Bentz and Sofranko (1997) suggest that the agricultural technology system context in which government extension organizations operate can be described under macro-factors and institutional factors. Under the macro-factors the agro-ecological, political-economic, socio-cultural, policy, infrastructure and under institutional factors research education and training, input supply, credit and farmer organisations and other NGOs are considered. Agricultural extension, whether public or private, operates in a context or an environment that influences the organization, form, and content of transfer activities (Moris, 1991).

Kasworm (2002) states that when adult learners attend training programmes, they find that their goals and motives for training programme attendance are tested, supported, and sometimes diminished by both the institutional world and their other worlds. Kasworm outlines five areas of self and society that influence the adults' navigation through their institutional experience: work responsibilities, family and significant other responsibilities, financial responsibilities, community responsibilities, student role responsibilities, and responsibilities to self.

For this study, the contextual factors that are considered to influence the transformation of farmers are the programme course offered, economic, political, and socio-cultural and

delivery mechanisms and learning environment. It is believed that farmers' transformation can be influenced by the programme course, the political-economic, the socio-cultural and delivery mechanisms and learning environment. These contextual factors are discussed in detail below.

2.8.1 The programme courses offered

Knowles (1976) is of the view that adult learners will avoid programmes that fail to meet their needs. This problem is attributed to the failure of the programme to meet the learner needs. This is because adults attend classes in order to learn how to be effective and efficient in their daily responsibilities. Hence, where a programme does not adequately satisfy their aspirations, adults get discouraged, attend classes irregularly and finally drop out. The most important issue is to promote active learning methods that can be easily adapted to adult learners and which can lead to quick research in order to sustain their interest. The adult learners can be motivated to actively participate in the training programme by involving them at all stages of the programme so that they feel part and parcel of the decisions made.

Murai (1985) explains that the problem of drop out affected Kenya's literacy programs which he attributed to the failure by government planners and administrators to understand the motivation for learning. It is, therefore, important that the factors which motivate adults are identified and incorporated in the training programme that is meant for the adults. The study by Murai observed that, despite Kenya staging a national literacy campaign, the country's problem on literacy is still associated to lack of motivation leading to high dropout rates. Freire (1970) states that people get interested in learning things that they hold strong feelings about and that learning, therefore, should focus on the needs of the learners.

Sandler (2000) points out that professionals who provide services to adult learners would benefit more from increasing their understanding of the specific needs of adult learners that they are handling. Then, after understanding the characteristics of this population, the challenge is to alter often well entrenched institutional systems to better address their needs. It is evident that the programmes which have been highly successful have greatly adapted to the individual needs of the adult learners, rather than expecting them to assimilate into the more traditional learning environment (Rhodes, 2001). Adult learners consist of demanding participants with very specific expectations for learning as they want it their way and if it is not their way they withdraw.

2.8.2 Economic status

Kasworm (2002) claims that financial instability of adult learners has been seen to be contributing significantly to problems faced by adults in training programmes. The background report (2002) also demonstrates that financial barriers play a key role in the participation of the adult learners. Despite evidence that those with higher education generally have higher earnings and more stable employment, many lower skilled workers do not see the need for further education and training as they often believe that their skills are adequate. On the other hand, Ndlovu and Moyo (2013) argue that cost may only reflect one aspect of financial barriers which is qualifications for financial assistance and financial mechanisms in support of learning opportunities.

In general, financial mechanisms are specific to the sector, program or institution in which a learner is enrolled. For example support systems in agriculture depend on factors such as whether or not a participant belongs to a specific group targeted for support. Chunga (2007) explains that for the farmers, the fragmentation of agricultural finance means that different rules apply for eligibility, level of support, and terms and conditions under which grants or loans are awarded and repaid. As a result, access and choice may be determined in many cases by the availability of financial support. MEAS (2014) states that the performance of any agricultural industry depends largely on how well and effective it is supported by services such as inputs distribution, marketing of products, finance and credit and extension services. Mbozi (2000) states that farmers' learning has been limited due to lack of resources required to implement learning projects.

2.8.3 Political factors

Chunga (2007) observes that farmers' organisations include cooperatives societies, farmers unions, commodity associations, agencies and some community based organisations. These organisations when well managed play a key role in empowering farmers by pooling them together so that they are able to benefit from economies of scale. These organisations provide inputs and credit, process and market produces, collect and disseminate market information to members, conduct membership education, they provide training on technical organisational issues and lobby and advocate on behalf of their members.

From the time Zambia gained her independence to the early 1990s the government sponsored and controlled cooperative not until its role shifted to only making sure that free trade took

place. This was due to the structural adjustment programme that was introduced in the nation. World Bank (2004) states that in 2001 the government put a general policy to put interventions to help small and medium scale farmers access support services in the agro-industry. Further still, the government in 2003 launched the fertiliser support programme which subsidised the identified vulnerable small scale farmers. Chunga (2007) illustrates that under this programme farmers were expected to raise 50 per cent of the total cost of inputs which were to be supplied and the government recoups this by way of collecting the equivalent in value of produce after harvest.

Swanson, Bentz and Sofranko (1997) argue that the policy component of an agricultural technology system can enable or limit extension in ways beyond the reach of extension managers this is because the principal areas of influence are price signals to farmers and decisions by government that affect public agricultural development organizations. The policy-makers set development goals and objectives such as achieving food security or surplus agricultural production to stimulate economic growth for rural development. Thus, amounts invested by government and the development community in agricultural development influence the pace and scale of effort.

The political factor influences the outcome of the training programme for the adults in that, in the case of farmers, their performance is largely dependent on how well and effective they are supported by services such as inputs distribution, marketing of products, finance and credit and extension services. The adult learners can gain all the skills and knowledge that is needed for them to develop and yet lack these support services, their lives will remain the same as if they never learnt anything.

2.8.4 Socio-cultural factors

Adults by nature have social responsibilities as parents, workers and community members and these responsibilities keep them busy most of their time. Ndlovu and Moyo (2013) explain that lack of time due to responsibilities in daily life is a major barrier in taking education and training by the adult learners. Adults are too busy during the day with work related activities and in the evening they are busy with family responsibilities. Therefore, for adults to be able to fully participate in programmes the time-table should be flexible to allow them to learn in their free time. However, adult learners when pressured with social

responsibilities and work, they would rather quit learning so that their social responsibilities do not suffer.

Further still, when the training programme overlooks the issue of context specific, the programme might fail. The culture of the people in a given locality is very important such that any learning that needs to take place has to consider the culture of that group of people. Omelewa (2002) explains that the stories that are bequeathed from generation to generation, the practices that are observed by women and men, the spoken language and even the accepted ways of dressing are everyday manifestations of how people should live in a given society. These activities of the local people have to be taken into consideration when planning a training programme.

Swanson, Bentz and Sofranko (1997) state that in many countries, socio-cultural factors are leading constraints to the effectiveness of extension this is because language differences and illiteracy can impede the communication of improved technology unless they are taken into account. The resource endowments of different categories of farmers also affect technology adoption levels. Subsistence farmers adopt mainly low-cost technologies. For this reason, extension work that focuses on cultural practices and affordable technologies may be more appropriate in countries with large numbers of resource-poor farmers.

In addition, culture influences the outcome of the training programme for adults in that people have traditions that influence the way people interact with each other. Further still, Leste (2004) suggests that division of labour between the sexes can differ along cultural lines and influences the nature of farming systems in different regions. In many countries, the men are employed off-farm, leaving the farm operations to women. In extension organizations, under representation of women on the extension force means that the production responsibilities and needs of women at the farm level may not be adequately addressed. For example, mostly when there are community meetings with traditional leaders, women sit at the side or behind the men such that when they want to share their opinion about the traditions of their clan they have to ask the tacit approval from the traditional leader as it is one way of showing respect to the wisdom of the traditional leader.

2.8.5 Delivery mechanisms and learning Environment

Crucial to the success of any adult education programme is the environmental support that the participant receives from family and institution. In adult education learners and environmental support compensates for weak academic support, but academic support will not compensate for weak environmental support (Bean and Metzner, 1985). Mokah (2005) argues that teaching methodologies and teaching approaches applied by adult educators are major causes for learners becoming disinterested in adult classes. Significant of which, was the failure to apply participatory approaches and exchange of ideas.

Knowles (1976) states that adult learning is enhanced by participatory learning methods which enable learners to be actively involved in the learning process. Moreover, Dando (1980) explains that participants become disinterested in learning activities which lack participation of the adults seeing that adults are co-creators in their learning. Further still, Freire (1973) argues that adults are not objects who should receive knowledge from the facilitators but are subjects who also have knowledge and skills to contribute in their learning. Lindeman (1926) also supports by recommending that adults have immense knowledge to share in learning programmes. Therefore, it is the ability of the facilitators to apply the right teaching action methods that will encourage the skills of such knowledge, skills and experiences among the learners. Moreover, Reche (1920) observes that the cause of premature withdrawal of learners from attending Nairobi's extra – mural programme is educators using pedagogic methods in teaching adults.

In summary the contextual factors can limit or shape the ways in which people come to understand who they are in effect, they constrain the degree to which people can be who or what they are. It is important therefore, that these contextual factors are identified in order to free participants from their coercive influence.

2.9 Justification of the study

In Zambia, several studies have been conducted related to the agriculture sector. For instance, Magande (1975) did a study on some basic economic aspects of small scale farming in Zambia: A case study of Ngwezi settlement scheme in Mazabuka district; Chunga (2007) did a study on a critique of management of agricultural support services in Zambia; Ng'andu (2011) also did a study on constraints on the development of the Mungwi agricultural settlement scheme in the Northern Province of Zambia: 1957 to 1991. Other studies have

looked at analysing agricultural policy process in Zambia by Mulengo (2015) and on agricultural innovations and development: a case study of communication about conservation farming in Katete district by Phiri (2015). None of these studies have focussed on analysing the agricultural extension programmes in Ngwezi settlement scheme from a transformative perspective. Hence, the need for the study.

2.9 Summary

This chapter has discussed issues surrounding transformative learning and its related concepts. The themes that formed the focus of this chapter were: productivity and efficiency; agricultural extension; transformative learning; process of developing a transformative learning curriculum; instructional methods of transformative learning; and the contextual factors influencing transformation of farmers.

For this study agricultural extension comprises all agricultural services provided to teaching farmers how to improve their productivity through research. The study also established that the content for transformative learning has to reflect the needs of the learners so as to help learners solve their problems. In making the content transformative the culture, generative themes and situations of the learners should be taken into consideration. Additionally, the study established that transformative learning can be achieved through discussion and exploration of concepts relating to the life experiences of the learners. The key idea is to help the learners actively engage the concepts presented in the context of their own lives and collectively critically assess the justification of new knowledge presented.

Finally, the study suggested that the contextual factors can limit or shape the ways in which people come to understand who they are and constrain the degree to which individuals can be who or what they are need to be identified in order to free participants from their coercive influence. The study considered the programme courses offered, economic, political, socio-cultural and delivery mechanisms and learning environment as among the contextual factors that influence the transformation of farmers.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology of the study. Kumar (2005) defines methodology as a systematic process of collecting research data aimed at providing answers to research questions. Kasonde-Ng'andu (2013) states that a research method is sometimes referred to as a design of the study or research procedure. However, the following are the common themes of the methodology: research design, population, sample size, data collection, research instruments, data analysis, and ethical considerations. This chapter therefore, describes the themes.

3.2 Research design

A research design can be thought of as the structure of a research to be carried out. It is the scheme, outline or plan that is used to generate answers to research problems (Kombo & Tromp, 2006). A research design is a plan that expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence on those relationships (Cooper & Schindler, 2008).

This study used a descriptive design because the data that was to be collected was descriptive in nature as the researcher needed to describe the situation of farmers in Ngwezi settlement scheme. Jackson (2009) states that a descriptive research design is a scientific method which involves observing and describing the behaviour of a subject without influencing it in anyway. Descriptive studies can involve a one-time interaction with groups of people (cross-sectional study) or a study might follow individuals over time (longitudinal study). Msabila and Nalaila (2013) state that the descriptive design will summarise the findings and describe the sample.

The study used both qualitative research and quantitative research, nonetheless, the study used more qualitative research because the study was describing the agricultural extension programmes from a transformative learning perspective. Qualitative research is a type of research that generates non-numerical data. It is a descriptive and analytical tool for research. It describes and analyses the problem deeply and broadly. In general, it generates rich and detailed data that contribute to in-depth understanding of the problem being studied

(Bandolier, 2007). Creswell (2009) states that qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.

On the other hand quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures (Creswell, 2008). Additionally, Gauch (2003) explains that quantitative research is a mode of inquiry used often for deductive research, and the goal is to test theories or hypotheses, gather descriptive information, or examine relationships among variables. These variables are measured and yield numeric data that can be analysed statistically to provide measurable evidence.

3.3. Population

Kasonde-Ng'andu (2013) is of the view that the population for a study is that group about whom the study desires to draw conclusions. It refers to an entire group of persons or elements that have at least one thing in common.

In this study, the population consisted of all extension officers, Senior Agriculture Officer (SAO) and all farmers in Ngwezi settlement scheme in Mazabuka District. The extension officers are the officers who provide farmers with agricultural extension training in Ngwezi settlement scheme. They are the main facilitators who help farmers in the farming scheme to ensure that the process of learning takes place. Ngwezi settlement scheme is divided into five zones which are block with 40 farms, block A with 39 farms, block B with 20 farms, block C with 34 farms and Chimmbe with 20 farms. There is one senior agriculture officer for Mazabuka district and the zones are managed by 2 extension officers. The total population of the farms in Ngwezi settlement scheme is 153 and are managed by 2 extension officers who are supervised by a senior agriculture officer.

3.4. Sample and sampling procedure

A sample is a small proportion of the entire population selected for observation and analysis. It is a portion of the population. Sample refers to the number of participants selected from the universe to constitute a desired sample (Bless, 1995) in Kasonde-Ng'andu (2013).

$$n = N/1 + N(e)^2$$

where n is the sample size; N is the population; and e is the level of significance

The sample for this study was 80 farmers from all the zones of the Ngwezi settlement scheme. Ngwezi settlement scheme is divided into 5 zones and the zones are managed by 2 extension officers. The senior agricultural officer supervises the extension officers in the scheme. These officers were purposively selected as they are a rich source of information for the study.

Stratified random sampling was to be used to select the 80 farmers from the Ngwezi settlement scheme because the settlement is divided into zones. Kombo and Tromp (2006) demonstrate that stratified random sampling involves dividing the population into homogeneous subgroups and then taking a simple random sample in each subgroup. This research technique was to be used as it would enable the researcher to select respondents in such a way that ensures certain subgroups in the population were represented in the sample in proportion to their number in the population. The study used the formula below;

$$F = n/N$$

Each category of the population would be multiplied by this fraction to obtain the corresponding category of the sample in each zone.

Systematic random sampling would later be employed to draw the different samples. Msabila and Nalaila (2013) state that systematic random sampling is the process of selecting subjects at a fixed interval. In this study the researcher had to select subjects at a fixed interval. The population of the study was 153 farmers in Ngwezi settlement scheme and the sample was 80 farmers and the researcher had to put the farms into list form and the interval was found to be 2. The researcher had to select the first farm with simple random sampling using lottery technique this was done to ensure against any bias.

interval = N/n (formula for calculating interval)

3.5. Research instruments

In collecting the data for the study, three different instruments were to be used. These are semi-structured interviews, semi-structured questionnaires and observation checklist.

3.5.1. Interview

Kasonde-Ng'andu (2013) argues that the interview is a method of collecting data in which an interviewer obtains responses from a subject in a face-to-face encounter or through a telephone call or electronic means. Interviews are frequently used in exploratory and descriptive research and in case studies as these are direct methods of obtaining facts from the respondents and are used in ascertaining values, preferences, interests, tasks, attitudes, beliefs and experiences.

In this study, the interview was used to collect information from the 2 extension officers and the senior agriculture officer (SAO) involved in agricultural extension programmes in Ngwezi settlement scheme. A semi-structured interview guide was used to guide the interviewer to collect data on the experiences of the Senior agriculture officer and extension officers in agriculture extension programmes. Each participant was interviewed for 2 hours to enable the researcher to gain more knowledge from the SAO and extension officers on agricultural extension programmes.

3.5.2. Researcher administered semi-structured questionnaires

Msabila and Nalaila (2013) states that a questionnaire is a written instrument used to obtain information from study subjects and gathers data over a large sample. The questionnaire is a highly effective method of data collection, in that it require less time to administer and therefore less expensive, and permit data collection from a larger sample.

The researcher administered questionnaires arrange for the collection of data which does not necessarily correspond to a pattern. The advantage of this is that because data does not need to correspond to pre-set variables, it is easier to explore dynamic and changing situations (Kasonde-Ng'andu, 2013). The researcher chose this instrument because majority of the farmers were illiterate on reading and writing hence, the researcher had to interpret the questions into the local language which is Chitonga. The researcher administered the questionnaire on average for 1:20 minutes on each participant. The researcher interpreted the questions for the participants in their local language then filled in the questionnaires on behalf of the participants.

3.5.3 Observation checklist

In this study the observation checklist was meant for the researcher to observe the farmers as they learnt. This was to allow the researcher observe the behaviour and talk of farmers during the lessons. Kombo and Tromp (2009) suggest that observation involves the systematic detailed observation of behaviour and talk that is watching and recording what people say and do. In order for the researcher to fully understand participants' behaviour he or she takes time to understand the community and the way of life of the people in that community. The researcher aims at understanding the participants in context so as not to use his or her world view to explain the behaviour of the participants. This tool provides the actual information on behaviour of the participants in an activity. Kasonde-Ng'andu (2013) explains that it provides for direct observation of participants which is useful for the researchers' understanding of participants in context.

3.6. Data collection procedure

Kasonde-Ng'andu (2013) posits that data collection refers to the gathering of information to answer research questions, gathering specific information aimed at proving or refuting some facts. The researcher interviewed both the SAO and the extension officers.

The extension officers and the SAO in charge of the agricultural extension programmes in Ngwezi settlement scheme provided information by way of interviews in approximately 2:00 hours session. Separate individual interviews were conducted with the officers who provided information on the study.

The researcher used self-administered questionnaires to collect data from farmers in Ngwezi settlement scheme who were selected as participants in the study. The researcher administered the questionnaire on each participant who were selected as participants in each zone. The researcher interviewed and administered the questionnaires on the farmers, the SAO and extension officers for one month in the study area where data was collected. The researcher used the local language to phrase the questions and repeated the questions in different words to help participants understand the questions. The research questions progressed from simple to complex in collecting information on the agricultural extension programmes in Ngwezi settlement scheme.

3.7. Data analysis

The study used both quantitative and qualitative data. Data analysis entails categorizing, ordering, manipulation and summarising the data and describing them into meaningful terms (Kombo and Tromp, 2006).

In this study qualitative data was analysed by manually identifying the main themes arising from the responses. The researcher read through all the questionnaires in the process of identifying the main themes then wrote down all the themes that were identified. The researcher later assigned codes to the identified themes and classified the responses under the main themes. The researcher finally integrated the main themes into the report. Dawson (2002) describes qualitative data analysis as a four step process that involves, identifying the main themes, assigning codes to these themes, classifying responses under the main themes and integrating themes and responses into the text of the report. Kasonde-Ng'andu (2013) explains that coding is an interpretive technique that both organises the data and provides a means to introduce the interpretations of it into certain quantitative methods. Kombo and Tromp (2006) argue that qualitative data, such as finding out the views of respondents on a certain issue is not always computable by arithmetic relations. The responses can be categorised into various classes which are called categorical variables.

With regard to quantitative data, data was analysed by entering the responses into the statistical package for social sciences software. The researcher then draw frequency distribution tables which the researcher used to present the findings in the report. Gauch (2003) explains that quantitative research is a mode of inquiry used often for deductive research, and the goal is to test theories or hypotheses, gather descriptive information, or examine relationships among variables. These variables are measured and yield numeric data that can be analysed statistically to provide measurable evidence.

3.8. Ethical consideration

The researcher got a consent letter from the University requesting each selected respondent for their consent to participate in the research. The researcher assured the respondents that information to be collected is purely for educational purposes and that their responses were highly confidential. The researcher further requested those who accepted to participate in the research to sign on the consent letters, and the researcher also informed the participants that they were free to withdraw at any-time they decide to do so.

3.9 Summary

This chapter has discussed the research methodology which was used in the study. The study employed both qualitative and quantitative approaches but it was more biased towards qualitative approaches which allowed the researcher to conduct an in-depth study on agricultural extension programme in Ngwezi settlement scheme. Qualitative and quantitative approaches were used in collecting and analysing data. The sample for the study was 83, which was to comprise 83 farmers in the scheme, 2 extension officers and 1 Senior Agriculture Officer. To collect data three instruments were used which are interview guide, questionnaires and observation checklist. Data that was collected was analysed by categorizing the emerging themes.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the findings of the study on a transformative learning perspective analysis of the agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District. The findings are based on the following objectives:

- a) To examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme.
- b) To assess the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme.
- c) To determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme.

The responses to these questions were presented by the follower farmers, lead farmers and agricultural extension officers in charge of agricultural extension programmes in Ngwezi settlement scheme. The total number of respondents presented in this section is 72 follower farmers out of 100, 20 lead-farmers and 3 extension officers. The reason for this was that 28 follower farmers had only attended the agricultural extension programmes once hence, could not respond to the questionnaires administered on them.

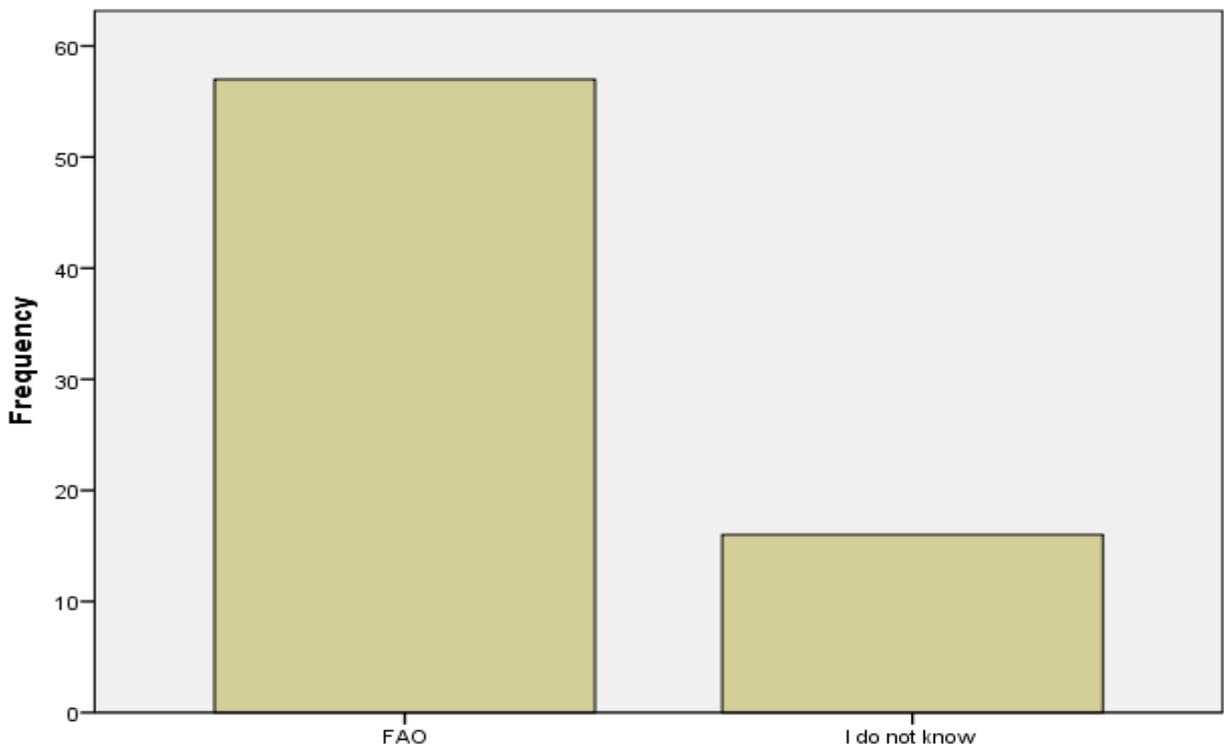
4.2. Process of Developing the Curriculum for Agricultural Extension Programmes

This section is based on the first research question which aimed at examining the process of developing the curriculum for the agricultural extension programmes in Ngwezi settlement scheme of Mazabuka District.

The aim of the above research question was to determine whether the process of developing the curriculum for the agricultural extension programmes was participatory or not. The researcher sought to fully describe how the process of developing the curriculum for agricultural extension programmes was carried out at the Ngwezi settlement scheme. In attempting to meet the aim, the researcher asked a number of questions such as who developed the curriculum for agricultural extension programmes, how was the process of curriculum development for agricultural extension programmes and if the target group participate in this process.

The respondents were asked to mention who developed the curriculum for agricultural extension programmes. The extension officers indicated that FAO was responsible for developing the curriculum for agricultural extension programmes as these were programmes for FAO. They explained that FAO had already made materials on the programmes they wanted to deliver to the farmers. The lead farmers also indicated that FAO was responsible for developing the curriculum for agricultural extension programmes.

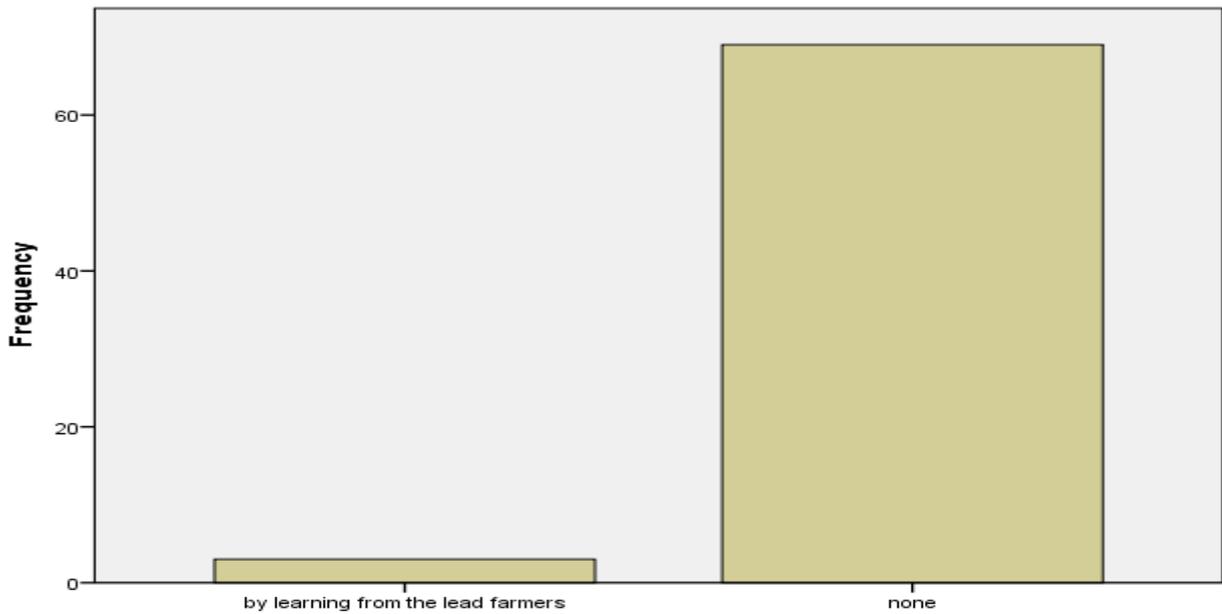
The bar chart below shows the responses obtained from follower farmers for the above question:



Bar chart 1: Who developed the curriculum for agricultural extension programmes

It was established that majority of the follower farmers (57) (i.e. 79%) mentioned that FAO was responsible for developing the curriculum for agricultural extension programmes while 15 respondents (i.e. 20.8%) said that they did not know who made the curriculum.

The respondents were also asked in what ways they participated in designing the curriculum of the agricultural extension programmes. The bar chart below shows the responses from follower farmer to the question:



Bar chart 2: In what ways learners participate in curriculum designing

It was established that 3 respondents (i.e. 4.2%) participated by learning from the lead farmers while 69 respondents (i.e. 95%) did not participate in anyway. On other hand, the lead farmers explained that they were invited for meetings by extension officers who read to them the contents that they were supposed to teach the follower farmers. Then the respondents took notes which they used in teaching the follower farmers. One respondent said:

"I am only taught what I should teach others, I carry my own books and take notes which I use as reference when teaching my followers."

Nonetheless, the extension officers indicated that FAO provided them with the materials they needed to use in delivering the content of the agricultural extension programmes. The extension officers explained that FAO had specific programmes and services designed for the farmers which they needed to deliver through working closely with Government Extension Officers.

The respondents were then asked how the curriculum for agricultural extension programmes was developed, both the follower farmers and lead-farmers expressed ignorance on how the curriculum was developed for agricultural extension programmes. However, the extension

officers indicated that farmers' union and non-governmental organisation went on research on new techniques then they met the extension officers and trained them in workshops and seminars. The extension officers further explained that they were given materials by the non-governmental organisations which they had to use in accordance with the contextual situation and technology itself in particular locations.

The figure below shows that NGOs take lead in developing the agricultural extension programmes while the government extension officers are recipients of already developed content.

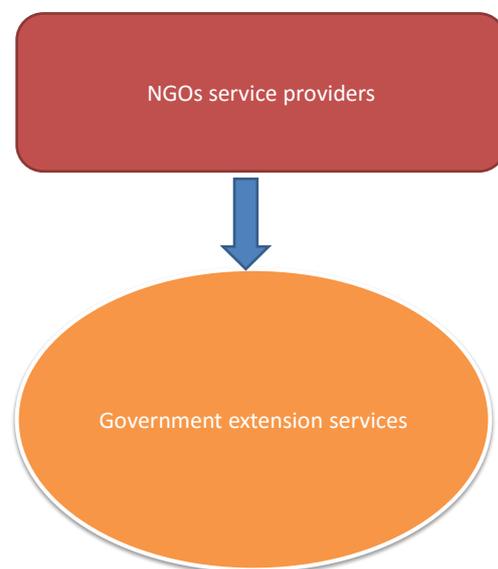


Figure 2: Developers of agricultural extension programmes

When asked to suggest the key players in developing the curriculum for agricultural extension programmes, majority of the follower farmers and lead farmers said that the government, non-governmental organisations and lead-farmers should be key players in curriculum development while some said that the participants (follower farmers) should also play a key part in developing the curriculum for agricultural extension programmes. However, the extension officers said that the government should be the key player in developing the curriculum for the agricultural extension programmes as they indicated that

normally farmers would listen more to the government as opposed to non-governmental organisations.

Therefore, from the above responses the researcher discovered that the process of developing the curriculum for the agricultural extension programmes was non-participatory because the sole beneficiaries of the programmes were left out in the process of developing the curriculum.

Consequently, the respondents were asked to describe what was taught in the agricultural extension programmes. Table 1 below shows the responses obtained from follower farmers for this question:

Table 4: Content in Agricultural extension programmes

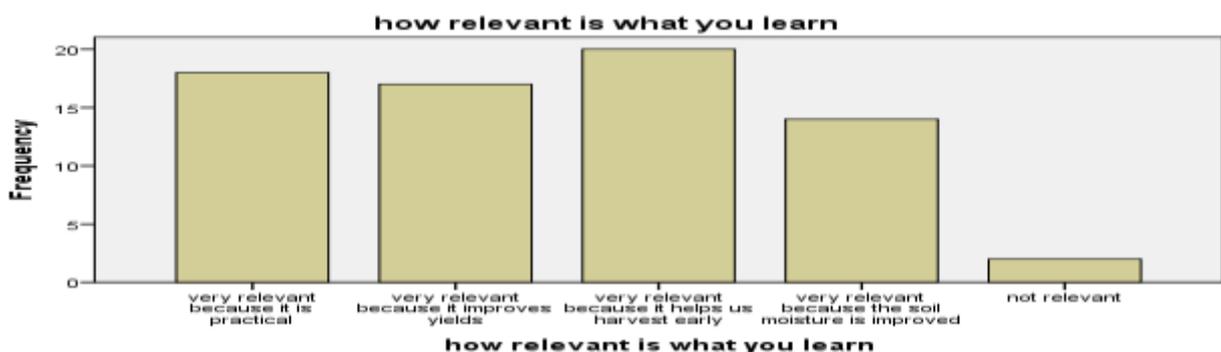
Contents in agricultural extension programmes	Frequency	Percentage (%)
Reaping and pot-holing	72	100
Planting musangu trees	72	100
Land preparation	13	18.1
Animal rearing	11	15.3
Composite manure preparation and application	10	13.9

It was established that all the 72 respondents (i.e. 100%) learnt reaping and pot-holing in the agricultural extension programmes. 14 respondents (i.e. 19.4%) in the 72 respondents learnt planting musangu trees. 13 respondents (i.e. 18.1%) in the 72 respondents learnt land preparation. 11 respondents (i.e. 11%) in the 72 respondents learnt animal rearing while 10 respondents (i.e. 13.9%) in the 72 respondents learnt composite manure preparation and application.

The lead farmers were also in agreement as they explained that they taught follower farmers on land preparation, pot-holing, reaping, musangu tree planting, application of manure and crop rotation. The extension officers as well said that they taught farmers on new techniques of farming, entrepreneurship, farming as a business and manure application.

The Ministry of Agriculture summaries the extension programmes into 4 different paradigms which are complementary rather than in conflict, each relevant to different needs and situations. The aim is that extension under each of the paradigms would be used to assist change in a number of areas such as production, food quality, product development, rural development or social improvement. The programmes are technology transfer, problem solving, education and human development. However, the programmes from the field focused on technology transfer and problem solving.

The respondents were asked to describe how relevant was what they learnt in agricultural extension programmes. The table below shows the responses obtained from follower farmers for this question.



Bar chart 3: Relevance of the agricultural extension lessons

It was established that 18 respondents (i.e. 25%) found the agricultural extension programmes to very relevant because they were practical. 17 respondents (i.e. 23%) found the agricultural extension programmes to very relevant because they improved yields. 20 respondents (i.e. 27.8%) found the agricultural extension programmes to be very relevant because they helped farmers harvest early. 14 respondents (i.e. 19.4%) found the programmes to very relevant because they improved soil moisture while 3 respondents (i.e. 4.5%) found the programmes not to be relevant. The lead farmers and extension officers expressed that the programmes

were very relevant as they helped the farmers to improve their yields as farmers and as such provide for their families.

The respondents were asked to suggest lessons that they felt they were not learning that they needed to learn. The table below shows the responses obtained from follower farmers for this question:

Table 5: New suggested lessons

New lessons	Number of respondents	Percentage (%) of respondents
what experts consider necessary	7	9.7
Crop rotation and composite manure preparation	26	36.1
How to use weed killers	6	8.3
How to rear animals	12	16.7
Market information	1	1.4
None	26	36.1

It was established that 7 respondents (i.e. 9.7%) felt that whatever the experts thought was necessary would be introduced. 26 respondents (i.e. 36.1%) felt lessons on crop rotation and composite manure preparation were needed. 6 respondents (i.e. 8.3%) felt lessons on how to use weed killers were needed. 12 respondents (i.e. 16.7%) felt lessons on how to rear animals were needed. 1 respondent (i.e. 1.4%) felt lessons on market information were needed while 26 respondents (i.e. 36.1%) felt no new lessons were needed.

One lead-farmer had this to say:

"I think farmers should also learn how to live healthy, management, rearing of animals and market information."

The lead farmers also stressed that they needed to acquire new knowledge considering the changing climate. However, the extension officers said that farmers needed no new lessons because they were already learning what they needed to know about conservation farming, they explained that farmers only needed to change their attitude toward the lessons. The

extension officers indicated that the lessons were complete to develop the farmers the only challenge was that farmers had a negative attitude towards the lessons.

4.2.2 Instructional Methods in Agricultural Extension Programmes

This section is based on the second research question which aimed at assessing the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme of Mazabuka District.

The aim of asking the above research question was to determine the likely methods in agricultural extension programmes. In attempting to meet the aim the researcher sought to discover what methods were recommended for use in agricultural extension, what methods were used to teach farmers and whether these methods used to teach farmers were helpful. In analysing the usefulness of the methods the researcher asked on whether the farmers were able to implement what they were learning in agricultural extension programmes.

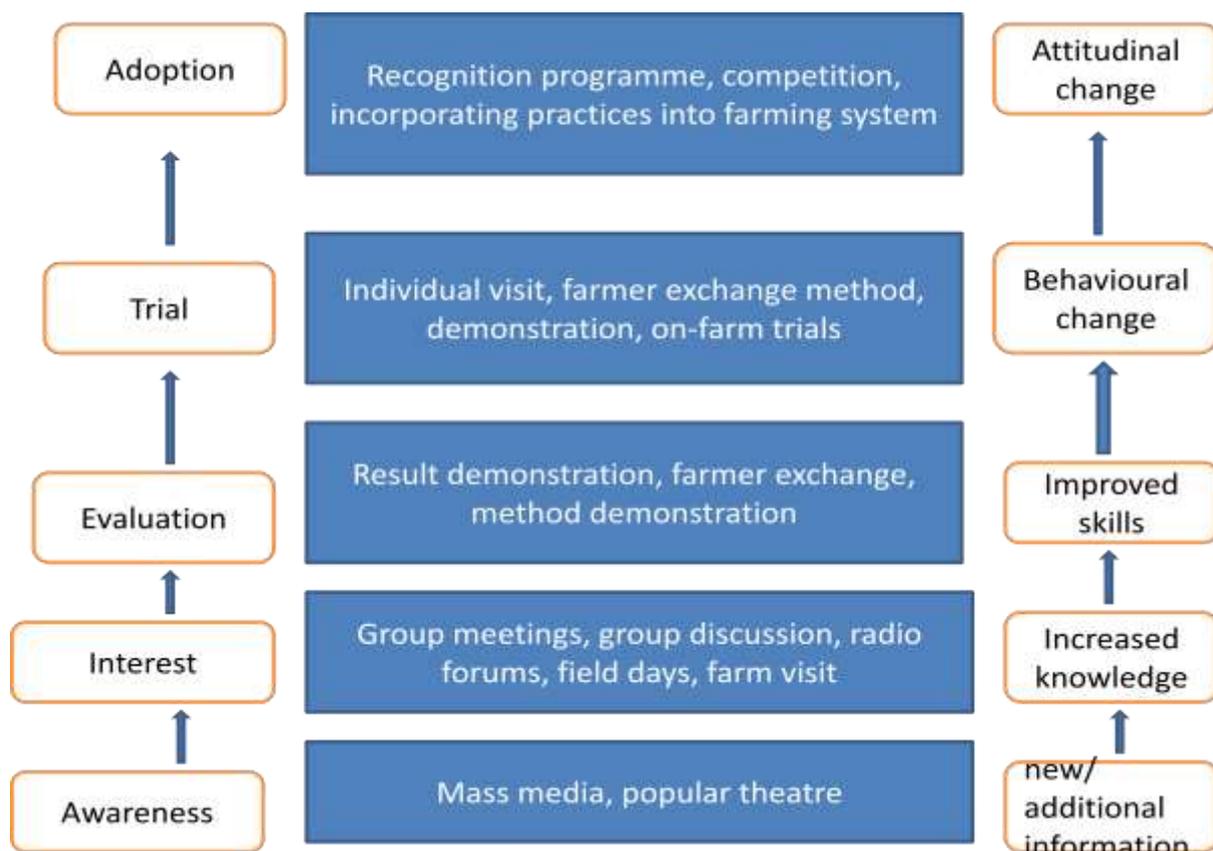


Figure 3: Recommended extension methods for use at different stages of adoption

Source: FAO- improving agricultural Extension. A reference manual (1997)

The Ministry of agriculture provides general operational guidelines for agricultural extension service providers for small-scale farmers in Zambia. The Ministry recommends that the method of extension service delivery should be Participatory Extension Approach (PEA) which is a defined methodology and systematic learning process focusing on cumulative joint learning using both indigenous and modern knowledge systems. Participatory Extension focuses on the full involvement and participation of entire communities or farmer groups in the development process. It recognizes that farmer communities are heterogeneous and that farmer problems are multidisciplinary and need to be addressed in a holistic manner. The emphasis is on facilitation rather than teaching of the communities so that communities understand the real source of their challenges. This is characterized by seeing community members doing more organized experiments concerning their developmental challenges and finding solutions. This has to be done being mindful of the four (4) extension pillars of Technology Transfer, Problem Solving, Education and Human Development. The use of lead farmers and demonstration plots should be encouraged

The figure below shows a summary of the participatory extension techniques of teaching as recommended by the Ministry of Agriculture.

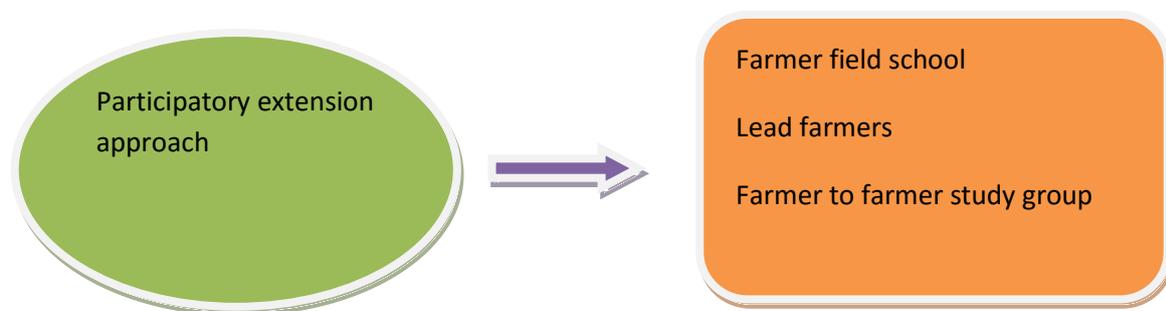


Figure 4: Techniques for participatory extension approach

The lead farmers and extension officers were asked to mention the recommended methods for agricultural extension programmes, majority of the lead farmers said that whichever method that the lead-farmers were comfortable with they were to use in teaching their follower farmers. The lead farmers indicated that individuals understood the lessons differently and had different teaching skills and hence they could not have similar teaching methods. Some

respondents said group teaching, discussions and demonstrations were the recommended methods. One respondent said:

"I meet with my follower farmers and use demonstrations showing them how to reap and dig holes with chaker holes and tractors. I also read to my followers what I learnt then we discuss the lesson in detail for everyone to understand."

Nonetheless, the extension officers indicated that practical methods that involved practical work and examples were the recommended methods for agricultural extension programmes. One extension officer said:

"I read to the lead farmers what is in the handouts and explain to them what is in the lesson then we make demonstration fields where I show them what the lesson was all about, however if we were learning how to reap we hire a tractor then we learn how deep the lines should be and the spacing between lines."

The follower farmers were asked to describe in what ways they participated during lessons, the follower farmers indicated that the lead farmers would read to them the lessons and asked questions and called for discussions. They also stressed that they would also learn through demo fields where the lead farmers taught through practical examples on how to dig holes and reap.

The follower farmers were asked what they learnt in the last one year from other farmers and it was established that majority of the respondents learnt on pot-holing, reaping, preparation of composite manure, growing of different cash crops and how to use herbicides while some expressed that they learnt nothing from other follower farmers.

When asked if they had taught a fellow farmer in the last one year, majority of the follower farmers had taught and shared with other follower farmers what they had learnt. They indicated that they taught pot-holing, reaping and how to grow a variety of cash crops while some farmers mentioned that they taught nothing. One respondent said:

" I am still learning that is why I cannot teach anyone."

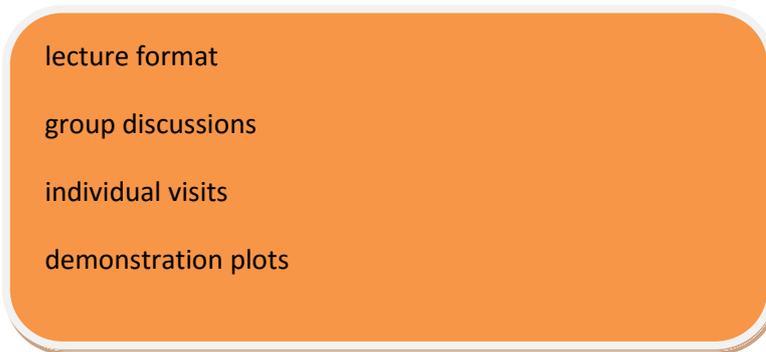


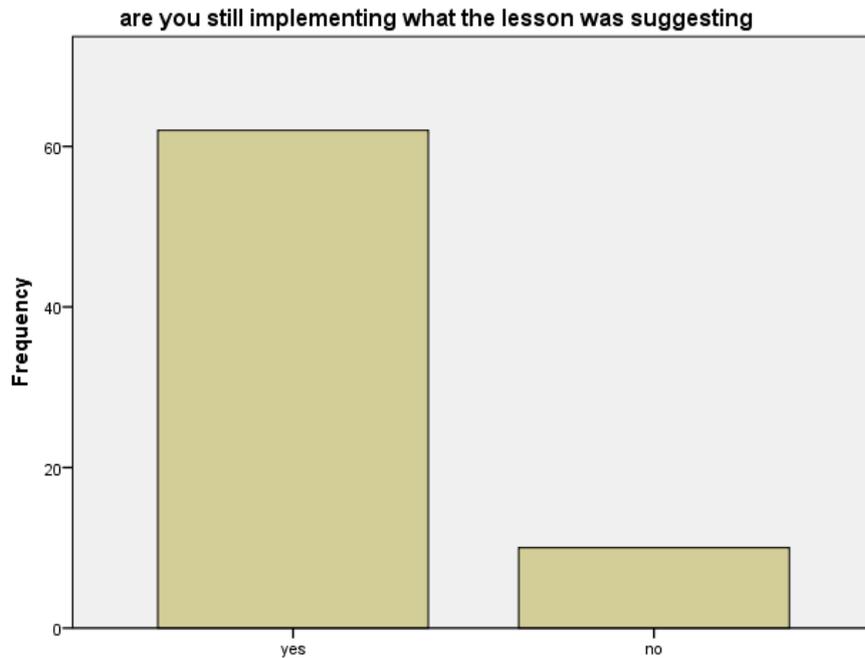
Figure 5: Summary of agricultural extension techniques

Source: Field Data (2017)

When asked to explain whether farmers were able to implement what they were taught, all the follower farmers said that they were able to implement what they learnt. Additionally, the lead farmers said that follower farmers were able to implement what they were taught and they stressed that some managed while others failed and this was due to the fact that others managed because they attended meetings while those who failed it was due to absenteeism. However, the extension officers indicated that farmers had failed so many times to implement what they learnt because they were rigid because of the traditional methods they had known and trusted since childhood. The extension officers explained that it was not easy to change the farmers because of their mindset. One extension officer said:

"Farmers have been learning and yet they are not improving because they are not changing as to implement what they learn, they always want to be dependent on extension officers as to do things for them."

The follower farmers were asked to state if they were still implementing what they were taught. The table below shows the responses from follower farmers for this question:



Bar chart 4: Farmers still practicing what they had learnt

It was established that 62 respondents (i.e. 86.1%) were still implementing what they learnt while 10 respondents (i.e. 13.9%) were not implementing. This was because other farmers had their maize withered some said they were not motivated to continue, some it was because of old age while others it was because of lack of tools and resources to buy in-puts that they needed.

The respondents were asked a follow up question to clarify what action was taken when farmers failed to implement what they were taught, the lead farmers indicated that they encouraged the farmers who failed to implement what they learnt to do better through visiting them and making more demonstrations. Some respondents said that they showed the farmers the goodness of pot-holing and reaping and the negatives of *chilime-lime*. They explained that they were however limited on what to do seeing that the follower farmers were adults and it was difficult to force them to change. On the other hand, the extension officers indicated that they had only continued to teach the farmers on the new climate change which they were able to relate to and this proved to be helpful. One extension officer said:

"There is nothing much that I do to encourage the farmers because they are adults who cannot be forced to do things as children, they are able to decide on their own what is good for them."

When asked to describe how the agricultural extension programmes had helped farmers improve their farming activities, the lead farmers said that the farmers knew when to plant, how to plant, how to apply fertilizer and apply herbicides to protect their crops. The lead farmers further explained that the farmers' yields had increased and that they were better than those who did *chilime-lime* as farmers now had the technical knowledge on farming and were able to implement what they learnt on their own. One lead farmer said:

"Through pot-holing, farmers have achieved good harvests despite the rains being a challenge."

However, the extension officers indicated that the yields had gone up but the difference was not so much between those practicing traditional methods (*chilime-lime*) and those practicing conservational farming. They explained that very few had managed to show a very big difference because very few managed to improve up to 50 percent and that farmers who had tractors were the ones who had really improved.

The respondents were further asked to describe how the agricultural extension programmes had helped farmers improve their living standard, the respondents indicated that the farmers were able to buy their own animals, provide for their families, take children to school and build houses with roofing sheets. However, one lead farmer said:

"The farmers have not really improved because they fail to buy farm in-puts, take children to school and do not afford good meals."

4.2.3 Contextual Factors that Influence the Transformation of Farmers who undergo Agricultural Extension Programmes

This section is based on the third research question which aimed at determining the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme of Mazabuka District.

The aim of asking the above research question was to discover the factors that influenced the transformation of farmers. In attempting to meet the aim, the researcher sought to determine what motivated the farmers to implement what they learnt, the challenges they faced in implementing what they learnt and the factors that limited the farmers from implementing what they learnt.

The respondents were asked to mention what influenced farmers to implement what they learnt, majority of the follower farmers stressed that it was because of the goodness they found in the lessons which was evident in the improved yields, while a significant number of lead farmers said through pot-holing and reaping the moisture content was improved and farmers had good and improved harvests. They stressed that farmers benefited from harvesting early because the programmes enabled them to plant early and their crops were not affected by the changing rain pattern. One lead farmer said:

"Poverty is what encourages them to attend because for most of them who have no resources pot-holing is the only option."

However, the extension officers explained that it was due to the benefits from FAO that farmers implemented what they learnt. They indicated that especially the lead-farmers they had benefited a lot and had improved in their farming activities as they were able to hire reapers, plant on large hectares of land and buy herbicides for their fields.

The respondents were asked how the agricultural extension programmes helped them transform their world. The table below shows the responses for the question:

Table 6: How the farmers had improved through the agricultural extension programmes

Improvement	Number of respondents	Percentage (%) of respondents
Buy farm in-puts and animals	13	18.1
Plant early and provide for the family	60	83.3
Able to do crop rotation	3	4.2
Nothing has changed	8	11.1

It was established that 13 respondents (i.e. 18.1%) their world transformed as they were able to buy farm in-puts and animals. 60 respondents (i.e. 83.3%) were able to plant early and provide for their families. 3 respondents (4.2%) were able to do crop rotation while 8 respondents (11.1%) their world had not transformed.

The respondents were asked on the challenges that they face in agricultural extension programmes. The table below shows the responses from follower farmers for the question:

Table 7: Challenges in agricultural extension programmes

Challenges	Number of respondents	Percentage (%) of respondents
Lack of tools and inputs	39	53.4
Lack of funds	72	100
Lack of visits from camp officers	72	100
Lack of markets and agro-shops	8	11.0
Weeds are overwhelming	3	4.1
Poor rains	72	100
Late delivery of inputs	15	20.5
No challenges	15	20.5

It was established that 39 respondents (i.e. 53.4%) had challenges with tools and in-puts. 16 respondents (i.e. 21.9%) lacked funds. 8 respondents (i.e. 11.0%) lacked visits from camp officers. 8 respondents (i.e. 11.0%) lacked markets and agro-shops. 3 respondents (i.e. 4.1%) were challenged with overwhelming weeds. 3 respondents (i.e. 4.1%) were challenged with poor rains. 15 respondents (20.5%) were challenged with the late delivery of rains while 15 respondents (i.e. 20.5%) had no challenges.

The extension officers pointed out that lack of resources was among the challenges that farmers were facing. They indicated that due to lack of resources the farmers were not able to hire reapers or buy herbicides because they were expensive and because of that farmers would plant on large portions of land but fail to weed because they failed to buy the necessary herbicides. The extension officers further stressed that other farmers did not know how to use the chemicals and others refused to use the chemicals due to fear of affecting the soil fertility. The respondents further explained that:

"The farmers can have the knowledge but fail to implement what they learn because of lack of funds."

The other challenges that were mentioned were that there were no camp houses in the settlement hence camp officers stay in town and lack of transport to use. The extension officers explained that the bikes that they used were provided by NGOs hence when the NGOs end their projects there is no maintenance on the bikes. One officer said:

"Transport has been an issue seeing that we are only given 10 to 20 liters of fuel in a month."

The respondents indicated that camp officers failed to visit the lead-farmers and that they were seen as idol, one extension officer said:

"It is true that the farmers do not remember when last they learnt because we have not been visiting them regularly."

The respondents further mentioned that the farmers doubted the sustainability of the methods. they explained that pot-holing was a difficult method because majority of the farmers had complained on the hardness of digging holes while reaping was expensive for majority of the farmers. They indicated that with the rise in fuel prices the charge for reaping was raised to 370 kwacha of which majority of the farmers could not afford.

The figure below shows an example of a pot-holed field which was done on less than a lima. Pot-holing is the act of digging basins in the field which should be not less than 15 centimeters deep and wide.



Table 6: pot-holed field

Source: Field data (2017)

Below is an example of a ripped field on one of the demonstration plots. It was done on half a hectare. Ripping is the drawing of straight lines in the field and farmers use tractors to rip.

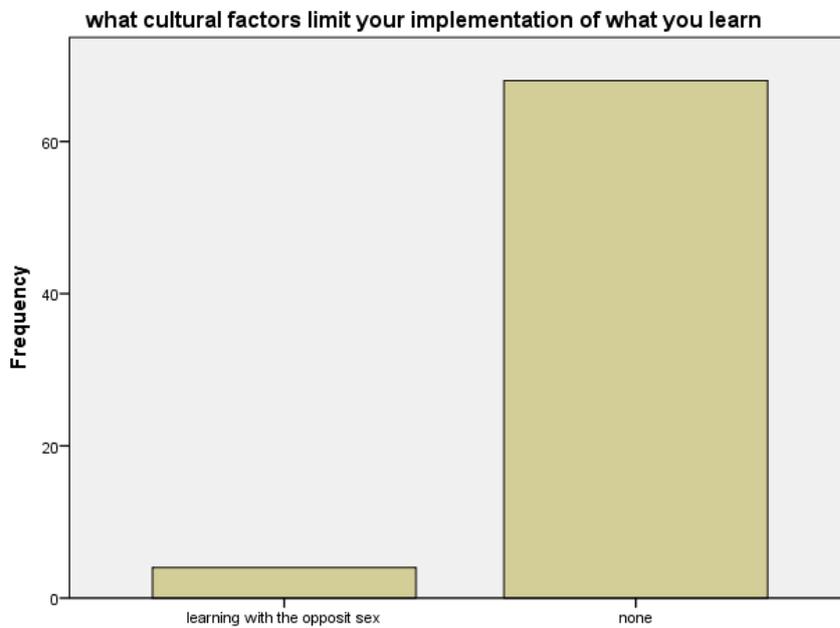


Table 7: Ripped field

Source: Field data (2017)

The extension officers were asked to mention the average sales of the various crops and livestock for farmers, majority of the respondent said due to poor rains the farmers had poor harvests and that they only had enough for consumption. The respondents explained that when the harvests were very good farmers sold 10 to 30 bags of maize and that they kept the surplus for food. However, one respondent said that one farmer managed to sale 200 bags of maize and 2 cows.

The respondents were asked on what cultural factors limit their implementation of what they learnt in agricultural extension programmes. The chart below shows the responses for the question:



Bar chart 5: Cultural factors that limit implementation of agricultural extension programmes

It was established that 4 respondents (i.e. 5.5%) found learning with the opposite sex limiting while 68 respondents (i.e. 93.2%) found no cultural factors limiting their implementation of what they learnt.

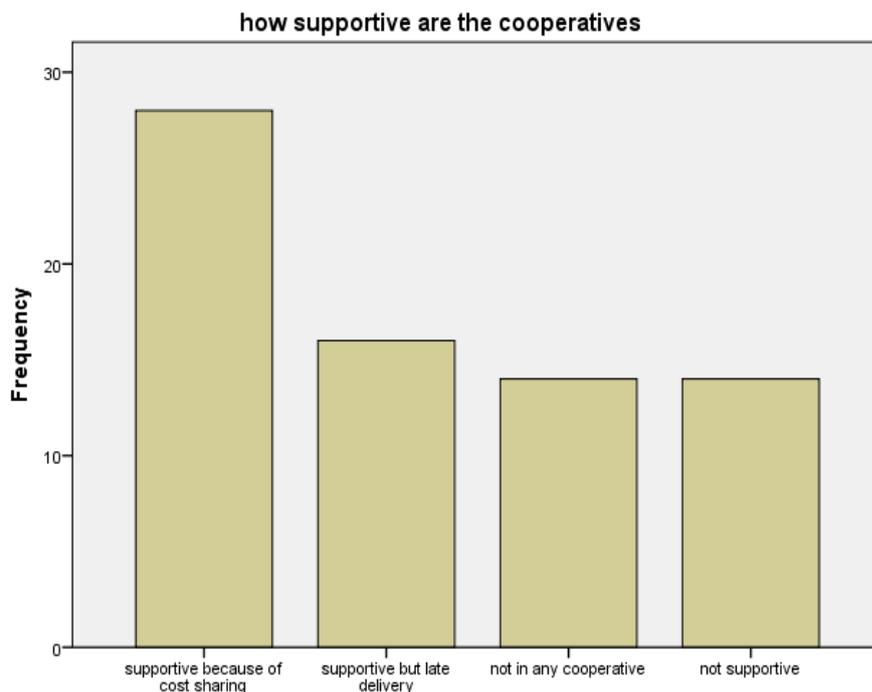
The respondents were asked on any lessons that were conflicting with their cultural beliefs in terms of gender roles. It was established that all the 72 follower farmers (i.e. 100%) found no lessons conflicting with their cultural beliefs in terms of gender roles.

The lead farmers also indicated that there were no cultural factors that limited the delivery of agricultural extension programmes to farmers. They however, mentioned that there were more women however, participating in the agricultural extension programmes as compared to men and that women were more responsive and actively involved during lessons. One respondent said:

"Men have a challenge in attending meetings while women are punctual and committed"

The extension officers indicated that there were no lessons that conflicted with the culture of the farmers however, there were more women participating in the agricultural extension programmes than men. The respondents explained that more than half of the participants were female and men normally took it to say they knew much than women.

The respondents were asked how supportive the cooperative societies were to farmers. The chart below shows the responses from follower farmers for the question:



Bar chart 6: How supportive the cooperatives are

It was established that 28 respondents (i.e. 38.4%) found the cooperative societies to very supportive. 16 respondents (i.e. 21.9%) found the cooperatives to be supportive but for late

delivery. 14 respondents (19.2%) were not in any cooperative while 14 respondents (i.e. 19.2%) found cooperatives not to be supportive.

On the other hand, majority of the lead farmers said that the cooperatives were supportive as they made possible for small scale farmers to access farming in-puts. The respondents further explained that the only challenge was that the farming in-puts were delivered late. One respondent had this to say:

"The cooperatives are good because they provide an opportunity for cost-sharing, however, the cooperatives are rigid as they provide no room for new members. The same old members continue to benefit from cooperatives every year."

Nonetheless, the extension officers explained that the co-operatives were very supportive as they help farmers access farm inputs. However, they indicated that the cooperatives were not growing as they rejected new members as a way of increasing the number of packs each farmer benefited. They further outlined that on average each cooperative was to have 40 registered members only and that they were only 13 cooperatives in the settlement. The respondents expressed concern as families were growing each year and so were the number of farmers yet the cooperatives were not growing.

The respondents were asked what areas of the agricultural extension programmes should be improved. The table below shows the responses for the question:

Table 8: Areas of improvement for agricultural extension programmes

Areas of improvement	Number of respondents	Percentage (%) of respondents
Early provision of farm inputs and tools	56	76.7
Provision of loans	72	100
Open agro-shops	4	5.5
Increase number of visits and farming inputs	31	42.5
Farmers to be consulted on inputs	3	4.1
Increase number of lessons	2	2.7
None	2	2.7

It was established that 56 respondents (i.e. 76%) said early provision of farm inputs and tools was to be improved on. 14 respondents (i.e. 19.2%) felt provision of loans was needed. 4 respondents (5.5%) opening of agro-shops was needed. 31 respondents (42.5%) felt the need of increasing the number of visits and farming inputs. 3 respondents (4.1%) felt farmers needed to be consulted on the farming inputs. 2 respondents (i.e. 2.7%) felt the need of increasing the number of lessons while 2 respondents (i.e. 2.7%) felt no area needed to be improved.

Lead farmers explained that the farming in-puts were supposed to be delivered in good time to farmers seeing that the farmers were taught on early planting. They further indicated that there was need for them to be allowed to choose the kind of farming inputs they were to get from FAO due to different soil samples. The respondents suggested that they needed to know how much each farming input costs on the vouchers. They explained that this was because they had no idea on how much they were spending on each input.

The lead farmer further mentioned that they needed the allocation of in-puts by FAO to be increased in order to allow follower farmers to benefit as well as lead-farmers benefit. They also suggested that the lessons should be increased in order to introduce new method of agriculture. The respondents also indicated that there was need to open agro-shops near the settlement scheme to enable the farmers access farm in-puts in time. The respondents moreover suggested that the extension officers were to improve on their number of visits and contact hours with lead-farmers

Summary

This chapter has presented the findings of the study on a transformative learning perspective analysis of the agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District. The study revealed that the process of developing the curriculum for agricultural extension programmes was non participatory. The extension officers, lead farmers and follower farmers all indicated that they were not involved in process of designing the contents of the agricultural extension programmes. However, the extension officers explained that they attended seminars organised by FAO where they were consulted.

The study further revealed that the lecture format, group discussions, individual visits and demonstration plots were methods used in delivering content. However, the lecture format

was found to be the most used method as both the extension officers and lead farmers use it in delivering lessons. Both the extension officers and lead farmers explained that they used to read to the participant and explained what the lesson was all about.

The study also revealed that farmers in Ngwezi settlement scheme were practicing what they learnt and that they were motivated to practice what they were learning because their yields had increased. However, the farmers indicated that they were facing challenges with tools, funds, poor rains, inputs (seed, herbicides, fertilizer and many others), visits from camp officers, markets and agro-shops. The other challenge is that follower farmers felt used by lead farmers to benefit inputs and hence, many follower farmers had withdrawn from the agricultural extension programmes.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings of the study on a transformative learning perspective analysis of the agricultural extension programmes in Ngwezi settlement scheme of Mazabuka District. This study focused on three objectives which were to: examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme; assess the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme; determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme.

5.2 The Process of Developing the Curriculum for Agricultural Extension Programmes in Ngwezi Settlement Scheme

The first objective of the study was to examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District. The aim of the objective was to determine whether the process of developing the curriculum for the agricultural extension programmes was participatory or not and how this affects transformative learning of farmers in agricultural extension programmes in Ngwezi settlement scheme. The issues that are prime to the learners are referred to variously by adult educators. For example, Freire refers to them as generative theme because to him they stimulate learners' feelings and Lindeman he calls them situations because they are relevant to specific situations.

The findings from the study revealed that farmers in Ngwezi settlement scheme participated in agricultural extension programmes under FAO. It was established that 72 of the follower farmers learnt on ripping and pot-holing. The follower farmers and lead farmers also indicated that they desired new lessons and this was seen as a gap by the researcher. Garry (2003) contends that even if extension programmes exist, they all too often do neither cover the knowledge demand of smallholders nor do they fit to their learning abilities and hence, training curricula are inappropriately designed. Which often leads to disregard the real needs of the target groups and particularly to ignorance of the voice of the poorest farmers. In consequence to an inadequate flow of knowledge and information to and from farmers would clarify this finding.

Nyerere (1976) suggested that development is for man, by man and of man. This means that development has to bring about an enlargement of man's ability in everyway. Freire (1973) mentioned that no one can develop another individual except that individuals develop themselves seeing that real needs are only known by people experiencing a particular situation. The gap that was discovered by the researcher was created due to the fact that the owners of the programmes were left out from participating in the process of developing the curriculum. As a result, their real needs were not taken into consideration.

Therefore, the process of developing the agricultural extension programmes was found to be non-participatory as the follower farmers, lead farmers and extension officers indicated that FAO was responsible for developing the curriculum and that they did not participate in designing the curriculum. Lamourdia and Malo (2009) indicate that conservation agriculture (CA) is a toolkit of agricultural practices that combines, in a locally adapted sequence, the simultaneous principles of reduced tillage or no-till; soil surface cover and crop rotations and or associations, where farmers choose what is best for them. In essence, CA is an approach that advocates the concept of sustainable intensification of production by picking the best possible options that farmers can apply at their own conditions. However, the questions to ask are; how do farmers then choose what is best for them and how are the best possible options picked and who determines them as best? Swanson, Bentz and Sofranko (1998) state that appropriateness of content is situation driven and appropriateness is defined within the scope of what is technically feasible, economically feasible, socially acceptable, environmentally safe and sustainable. This implies that situations of participants determine what should be in the content.

It was further revealed that the follower farmers, lead farmers and extension officers were recipients of already developed contents. However, the study also established that extension officers would attend training organised by FAO through workshops and seminars on the contents to be delivered to farmers. This finding is in contrast with Mezirow (1989) who points out that an educator is not to decide on the outcome for the transformation for if this is done then this is indoctrination and not transformation. This is because educators responsible for transformative experiences should not push students in any particular direction. Dirkx (1998) explains that knowledge is not viewed as something out there to be taken in by the learners. Rather, it arises within the social acts of trying to make sense of novel experiences in the day to dayness of participant's lives. To be meaningful, what is learnt has to be viewed

as personally significant in some way; it must feel purposive and illuminate qualities and values of importance to the person or group.

As such, Freire (1990) suggests that relevant generative themes should be used in adult education seeing that the aim of education is radical transformation as participants are all called upon to transform their own personal lives, community, environment and the whole society. Similarly, Ball and Pence (2006) explain that a generative curriculum starts and develops on the interests of learners and also facilitators interests to some degree and these interests remain at the centre of teaching and learning and in this way new knowledge is generated and new curricular content is created collaboratively. In using generative curriculum learning becomes dynamic because the interests of learners are put at the centre and these interests surface new areas of interest because as themes and topics are initiated and actively pursued, connections and relationships are made between the identified interests.

Freire (1999) explains that these interests surface people's emotions and generate some energy and hope for action towards emancipation as in using generative themes, it is expected that teaching-learning transactions will proceed in ways that renew knowledge and skills, inspire insights and new visions and generate authentic knowledge in shared processes. Furthermore, Nsamenang and Tchombe (2011) illustrate that generative education provides rich opportunities for inquiry based learning. The learners take ownership by pursuing their interests and in so doing discover and develop their potentials, passions and talents. Hence, generative inquiry embodies an underlying belief in adult learners as learners whose natural curiosity leads them to explore their world in meaningful ways. Freire (1999) argues that a generative approach is perspective not a method as it is a way of viewing teaching and learning that respects the fact that each participant comes to the learning environment with varied interests, skills and knowledge of the world. This is because the participants in a generative approach will use their experiences and hence, be actively involved at all stages of their learning programmes.

Similarly, Lindeman (1926) points out that adult education takes place in relation to concrete situations and these are always educational situations, not subjects and that the objective of adult education is to further the process of development and growth (of individuals and the human species), content being only a means to furthering this process. In adult education the curriculum should be built around the student's needs and interests with students playing an

active role in deciding what should be learnt in the educational process as the purpose of adult education is to put meaning into the whole of life of participants.

Lindeman (1926) explains further that every adult person finds himself in specific situations with respect to his work, his recreation, his family-life, his community-life ..., situations which call for adjustments. Adult education begins at this point and the subject matter is brought into the situation, is put to work, when needed. Freire (1999) explains that texts and educators play a new and secondary role in this type of education for they must give way to the primary importance of the learner. The situation-approach to education means that the learning process is at the outset given a setting of reality thus, intelligence performs its functions in relation to actualities, not abstractions.

Mezirow (2012) indicates that the goal of adult education is to help adults realise their potential for becoming liberated, socially responsible and autonomous learners and that adult educators actively strive to extend and equalise the opportunities for them to do so. New information is only a resource in the adult learning process thus, to become meaningful, learning requires that new information be incorporated by the learner into an already well-developed symbolic frame of reference, an active process involving thought, feelings, and disposition. The learner may also have to be helped to transform his or her frame of reference to fully understand the experience.

In emphasising the importance of experience, Lindeman (1926) explains that experience is the stuff out of which education is grown as it is a homely matter. The affairs of home, neighbourhood and local community are vastly more important educationally than those more distant events which seem so enchanting. This is because to him education is life and an educational experience of continuous learning with a vital personality fulfilling the preparation of life, a life with meaning, a life with growth, and a life of becoming.

Furthermore, in reference to the participation levels 15 under chapter 2, the follower farmers and lead farmers were participating on the first level of passive participation while the extension officers were participating on the third level of consultation, of which both levels are low levels of participation. At the first level people participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without any listening to people's responses and the information being shared belongs only to external professionals. Participation by consultation on the other hand,

in tells that people participate by being consulted, and external agents listen to views. These external agents define both problems and solutions and may modify these in the light of people's responses. However, such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people's views.

The finding on participation contradicts with Cheruiyot (2012) who suggests that participation of adult learners is very important for the successful development, implementation and evaluation of programmes and have to be involved at all levels because their views, suggestions and requests need to be integrated in the development of the programmes in order to raise their level of motivation and confidence with which to participate in the programmes. Similarly, Gboku (2007) explains that the participation of adult learners can be increased by the involvement of all stakeholders, who could be the community, the learners, the prospective learners, the beneficiaries thus, developers should involve adults in the identification of educational needs of the learners and setting the educational goals for the programmes. The argument is that the community and the learners need to be involved in identifying their needs, if they are to be motivated in participation unlike the finding in the study.

Consequently, the non-participatory nature of the agricultural extension programmes in Ngwezi settlement scheme has affected transformation of the farmers in that the extension officers, lead farmers and follower farmers feel these are FAO programmes and not theirs. Hence, the farmers have not taken ownership of the programmes and they are not affected whether these programmes fail or not because to them it is FAO as an organisation that will fail and not them. This was evident in farmers withdrawing from the programmes as they felt that they had nothing to lose. This finding is in agreement with Knowles (1970) who clarifies that adult learners will not value programmes that they feel are being imposed on them as Knowles also indicates that learners will withdraw from learning experiences when they feel that their needs are not being met.

5.3 The Instructional Techniques for the Agricultural Extension Programmes

The second objective sought to assess the instructional techniques of the agricultural extension programmes in Nwgezi settlement scheme. The researcher sought to determine what transformative techniques are and whether the instructional techniques used in agricultural extension programmes in Ngwezi settlement were transformative.

The study established that various instructional techniques were recommended for conservation agriculture at different levels of the programme starting from awareness to adoption. This finding agrees with Beal, Rogers and Bohlen (1957) who provide a sequence of stages to describe the adoption process and these include awareness, information, evaluation, trial and adoption. The study also established that the Ministry of Agriculture and Livestock in the general operational guidelines for agricultural extension service providers for small-scale farmers (2012) recommends that the method of extension service should be participatory extension approach (PEA). The extension officers also indicated that the recommended methods for agricultural extension programmes were participatory methods that enable learners to be actively involved in the lessons. This finding is in line with MEAS (2014) who explains that the most prevalent approaches and methodologies today in agricultural extension include Farmer Field Schools (FFSs), on-farm demonstrations, and other group -based learning that promote a culture of curiosity, careful observation and adaptation among farmers.

The study further established that majority of the lead farmers were not clear on the methods to be used in delivering content to the follower farmers as they indicated that whichever method the lead farmers were comfortable with they were to use while some of the lead farmers said that group teaching, discussions and demonstration were recommended methods. The study also established that follower farmers learnt mostly through the lecture method, they also learnt through group discussions as the lead farmers would call for contributions and asked questions, and made demonstration plots. Additionally, the follower farmers learnt and taught each other during their free time.

Unlike the findings above, Mezirow (2003) recommends learner-centred, participatory and interactive instructional techniques should be used as they foster critically reflective thought, imaginative problem posing, and discourse and involve group deliberation and group problem solving. In such education instructional materials reflect the real-life experiences of the learners and are designed to foster participation in small-group discussion to assess reasons, examine evidence, and arrive at a reflective judgment. In these instructional techniques learning takes place through discovery and the imaginative use of metaphors to solve and redefine problems and methods such as learning contracts, group projects, role play, case studies, and simulations are classroom techniques associated with transformative education.

The study however, established that the most used technique of instruction was the lecture format as both lead farmers and follower farmers indicated that lessons were read to them and they took notes which they later referred to. The lecture format is teacher centre as such the learners are passive and listen to the teacher who delivers the lessons to learners. This technique of instruction leads to what Freire calls the 'banking system' because it leaves little room for participants' participation in the learning process. In contrast to the finding Freire (1970) positions that participants are to be actively involved in the teaching and learning process because the banking concept of education regards men as adaptable, manageable beings as the learners are made to listen to the facilitator who assumes the role of an expert and acts as the custodian of knowledge. However, the more students work at storing the deposits entrusted to them, the less they develop the critical consciousness which would result from their intervention in the world as transformers of their world.

In contradiction to the finding of the lecture technique, Lindeman (1926) points out that the resource of highest value in adult education is the learner's experience because if education is life, then life is also education. Experience therefore, is the adult learners textbook and hence, the learners should be made to be actively involved in the learning process because they are not empty vessels who are waiting to be filled in with knowledge but they are themselves knowledgeable.

In addition, the study established that farmers learnt through discussions which took place during lessons. The extension officers and lead farmers explained that after reading the lessons to the farmers they would call for discussions. This finding is in support with Lindeman (1926) who indicates that authoritative teaching, examinations which preclude original thinking, rigid pedagogical formulae, all of these have no place in adult education. Similarly, Mezirow (2000: 19) explains that transformative learning is deeper learning and requires a questioning or challenging of underlying assumptions and premises on which beliefs are based, which causes a shift in the codes that makes up a meaning perspective and this will consequently disturb the related points of view. The focus is on discovering the context of ideas and the belief systems that shape the way people think about their sources, nature, and consequences, and on imagining alternative perspectives.

The finding on discussion is clarified by Freire (1970) who explains that knowledge can only emerge through invention and re-invention, through the restless, impatient continuing, hopeful inquiry as people pursue in the world, with the world, and with each other. This

process is the opposite of education of receiving information through being told by teachers, Freire called this as 'banking education' which is unlikely to empower learners, since if students do not learn to think for themselves, they are unable to participate in democratic processes to transform themselves.

With regard to the above finding, Mezirow (1998: 12) outlines the optimal conditions for discourse:

... have accurate and complete information; be free from coercion and distorting self-deception; be able to weigh evidence and assess arguments as objectively as possible; be open to alternative perspectives; be able to critically reflect upon presuppositions and their consequences; have equal opportunity to participate ... and be able to accept an informed, objective and rational consensus as a legitimate test of validity.

Discourse is necessary in validating what and how one understands, or arrives at a best judgment regarding a belief as such, learning is a social process where learners interact, and discourse which becomes central to making meaning. This is because a best judgement is always tentative until additional evidence, argument, or a different perspective is presented that may change it. That is why it is essential to seek out and encourage viewpoints that challenge prevailing norms of the dominant culture in matters of class, race, gender, technology, and environmental protection (Mezirow 2000).

Similarly, Freire (1973) suggests that dialogue is crucial in every aspect of participatory learning and in the whole process of transformation. Furthermore, Freire and Macedo (1995) indicate that dialogue is at the centre of adult learning process as it is a dialogue of equals and through this social process knowledge and learning are generated. Through the use of dialogue participants learn from each other's experiences and also the educator is given opportunity to become a learner who learns from the participants.

The finding above on discussion is clarified further by Wallerstein (1983) who illustrates that for dialogue to be effective the facilitator needs to use the problem posing approach which utilises cultural themes in the form of open-ended problems. These open-ended problems are incorporated into learning materials in form of pictures, comics, short stories, songs, and video dramas, which are then used to generate discussion. In the problem posing approach the facilitator asks a series of open-ended questions about these materials that encourage adult

learners to elaborate upon what they see in them. Ultimately, this questioning process leads the participants to define the real-life problem being represented, discuss its causes, and propose actions that can be taken to solve it. Unlike the finding on discussion were the extension officers and lead farmers called for discussions on what they read to the participants to see if they understood the lessons the problem posing approach was not fully utilized.

The study also established that demonstration plots were used as methods of instruction. This finding is in agreement with MEAS (2014) who explains that farmers are grouped into commodity study groups or interest groups where farmers are interested in forming such groups by extension officers who also identify lead farmers or early innovators and demonstration plots are established at their farms. The assumption is that demonstrations when done hands-on throughout the crop or livestock cycle the farmers will fully benefit and gain the knowledge and skills needed. The finding contradicts Lamourdia and Malo (2009) who challenge to move beyond pilot and demonstration plots as they suggest a different direction for CA in the booklet that aims at providing the basis for up scaling CA by addressing the strategy and approaches to engage policy makers and other stakeholders (farmers, agro pastoralists and pastoralists, donors, researchers, extensions and the private sector).

The study established that the demonstration plots were an effective way of delivering content to the farmers because they provided for hands on experience for the farmers, as they were able to practice what they learnt. It is true that adults learn best when they are given an opportunity to practice, to try out what they are learning because some activities cannot be learnt without actual practice, therefore, adult education has to be practical. Gadotti (1994) explains that through practical work experiences, interacting with real clients and their real life situations, students move from classroom and textbook mode to hands on problem solving the learning applies to life and the work context.

Mezirow (1997) cautions that learners need practice in recognizing frames of reference and using their imaginations to redefine problems from a different perspective. Thus to facilitate transformative learning, educators must help learners become aware and critical of their own and others' assumptions as well as be assisted to participate effectively in what they are learning. Hence the method of demonstration plots promotes active participation of the participants in the learning environment when done in a way that all participants are given an

opportunity to practice what they are learning. Thus, it is important that all farmers have or develop demonstration plots on their farms and extension officers and lead farmers assess or examine the progress of these plots. This may prove to be effective in insuring that all learners actively participate in their learning programmes as it will motivate them in implementing what they learn.

Furthermore, the study discovered that the extension officers would visit the lead farmers in their area of operation to check on their progress. The lead farmers also indicated that they visited those learners who were not actively attending meetings and this method was classified as the individual visit method. The lead farmers explained that they would make follow ups on those learners who were not coming for meeting in order to encourage them by explaining the benefits of potholing and ripping.

Finally, the study established that both the lead farmers and follower farmers learnt and taught each other during their spare time. This finding is in support of Mezirow (2000) who explains that in fostering self-direction, the emphasis is on creating an environment in which learners become increasingly adept at learning from each other and at helping each other learn in problem-solving groups. This is because learners feel encouraged when they learn from each other because they develop the hope that they are also able to do what their fellow learners are doing. Similarly, Lindeman (1926) clarifies that adult education should constitute working in small groups as it is central to understanding of a worthwhile education as it involves small groups of aspiring adults who desire to keep their minds fresh and vigorous; who begin to learn by confronting pertinent situations; who dig down into the reservoirs of their experience before resorting to texts and secondary facts; who are led in the discussion by teachers who are also searchers after wisdom and not oracles: this enables the learners to continue on their quest for life's meaning and freire calls this process as praxis.

Further Mezirow and Associates (1990) explain that the key idea in learning experiences is to help the learners actively engage the concepts presented in the context of their own lives and collectively critically assess the justification of new knowledge. Together, learners undertake action research projects and are frequently challenged to identify and examine assumptions, including their own and methods that have been found useful include critical incidents, metaphor analysis, concept mapping, consciousness raising, life histories, repertory grids, and participation in social action.

Considering the levels of learner involvement in the instructional techniques in Ngwezi settlement scheme, the researcher discovered that the lecture format and demonstration have low learner involvement as the facilitator is actively directing the lessons. On the other hand, the discussion method and problem-solving groups have high learner involvement as learners contribute through asking questions and making contributions and as such direct the learning process. The transformative learning theory can be said to advocate for instructional techniques that are interactive, participatory and learner centred as they enable participants to be actively involved in the learning process as they share their experiences. Dialogue is at the centre in these techniques as it is used as an instructional technique that stimulates discussion among learners and between learners and the facilitator. The goal being to awaken participants for action in order to bring about the desired change and development. Therefore, the findings on instructional techniques show that the teaching and learning process fell below the recommended techniques for transformative learning as the lecture and demonstration techniques are not transformative techniques.

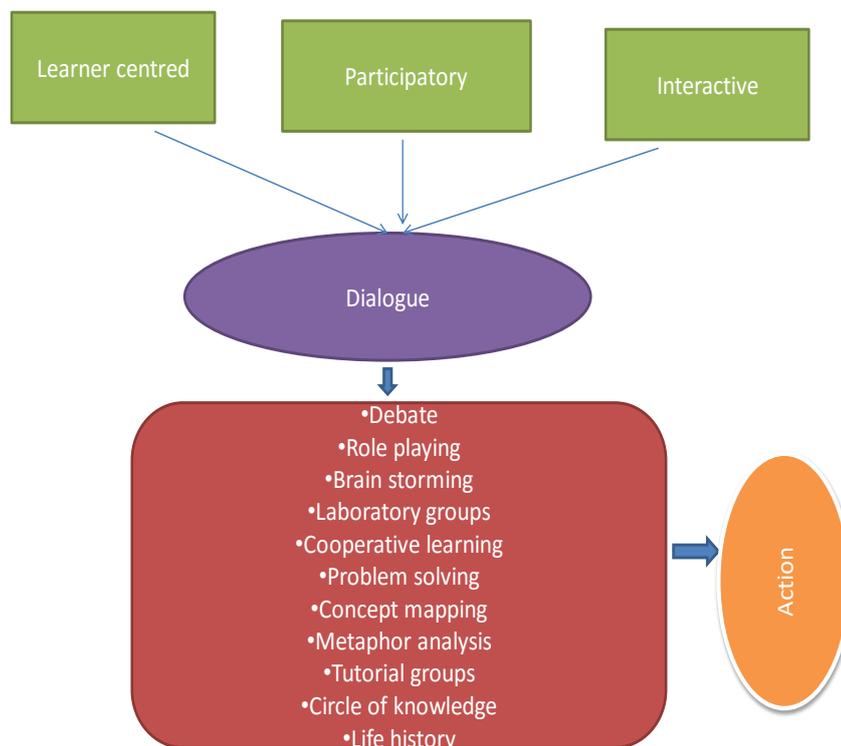


Figure 8: Summary of Transformative Techniques

5.4 The Contextual Factors that Influence the Transformation of Farmers who undergo Agricultural Extension Programmes

The third objective of the study was to determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District. The aim of the research objective was to determine what motivated the farmers to implement what they learnt and what limited them from implementing what they learnt. This objective will be discussed under the emerging issues from the research.

The study established that farmers were motivated to participate in the agricultural extension programmes because of their yields that had improved. The lead farmers and follower farmers explained that through the improved yields they were able to meet the basic needs (paying school fees, providing food for the family, building modern houses and many others), hence, improving their living standards. However, the extension officers explained that there was no much difference between those practicing conservation agriculture and those practicing conventional farming. This finding is in support with Lamourdia and Malo (2009) who states that conservation agriculture where it has been implemented has shown a high potential to reverse the trend of soil infertility often caused by extractive and exploitative farming methods. The intensive annual tilling of the soil destroys soil structure, produces a hard pan in the soil, restricting root growth and stunting plant growth. Moreover, the impact of raindrops on bare soil causes sheet and rill erosion. The resulting soil erosion and land degradation are quite severe in Africa and lead to an annual decrease of 3 percent agricultural production. As such FAO (2010) defines conservation agriculture as a way of managing agro-ecosystems to achieve higher, sustained productivity, increased profits and food security while enhancing the environment. This definition supports the argument that conservation agriculture is meant to bring about increased, improved and sustained yields of farmers.

It was further established that there was no trust between the lead farmers and follower farmers because the follower farmers felt used by lead farmers to benefit inputs from FAO. It was discovered that lead farmers benefited inputs such as herbicides, sprayers, bicycles, and seed from FAO and the follower farmers benefited no inputs other than the knowledge they got from the lead farmers. However, the senior agricultural extension officer explained that the inputs were to benefit both the lead farmers and their follower farmers and they were to be used on demonstration plots and that whatever was harvested was to be shared equally

among the farmers. Nonetheless, this information on who should benefit inputs from FAO was not clear to the lead farmers and their follower farmers and hence, the confusion and mistrust between the lead farmers and their follower farmers.

Moreover, this confusion led to many follower farmers withdrawing from the programmes. The study established that most of the lead farmers had less than 5 active follower farmers attending agricultural extension programmes which was very challenging because each lead farmer had 12 to 15 follower farmers they were leading when they qualified for the position of lead farmer. This finding is clarified by Knowles (1973) who explained that adult learners attend class voluntarily and leave whenever the teaching falls below the standard of interest. This is because adult learners can never be forced to attend learning programmes and hence, they should be appreciated and taken serious whenever they attend learning programmes. In the learning process it becomes important that all barriers are removed to enable learners participate fully and freely. Similarly, Lindeman (1926) clarified that the external tokens of education should be removed so that the learning process stands or falls on its intrinsic merits.

MAL (2012) also clarifies the finding on incentives that incentives are to be removed in order to make the agricultural extension programmes sustainable. Removing the external tokens in the agricultural extension programmes can end the confusion existing between lead farmers and the follower farmers as this can bring about equality among the farmers. Nonetheless, the farmers are not able to buy all the needed inputs for the CA technology to enable them implement what they learn, hence, they need to be assisted in purchasing the inputs. It is therefore, important that both the lead farmers and follower farmers benefit equally from the incentives and there has to be transparency and oneness between lead farmers and follower farmers.

With regard to the above finding, Cranton (2006) recommends that facilitators should establish authentic, meaningful, and genuine relationships with learners and facilitators can only achieve this through engaging the participants in genuine discussions as a way of creating trusting relationships. The process of engaging participants in genuine discussions is done in order to build consensus between the facilitator and the learners and also among the learners. Mezirow (2000) clarifies that people must accept the on-going nature of consensus building with an emphasis on the process and a toleration of ambiguity, instead of rushing to clarity and closure so as to reach a common understanding. Consensus building will be

helpful in Ngwezi settlement as it will enable extension officers, lead farmers and follower farmers in developing trusting relationships because the different groups will reach a common understanding and hence, each participant will feel important and part and parcel of the decisions made. However, the process of consensus building should involve everyone and people should allow for all contributions so that no one feels inferior.

Similarly, Mezirow (2003) explains that effective discourse depends on how well the educator is able to create a situation in which those participating have full information, are free from coercion, have equal opportunity to assume the various roles of discourse (to advance beliefs, challenge, defend, explain, assess evidence, and judge arguments), become critically reflective of assumptions, are empathic and open to other perspectives, are willing to listen and to search for common ground or a synthesis of different points of view, and can make a tentative best judgment to guide action. The participants should not feel forced to do things and feel others are more important than others but all should be treated equal and given equal opportunities to participate.

The other emerging issue from the study was that the mind-set of the follower farmers had not changed. The extension officers and lead farmers explained that the difference between those practicing traditional methods of farming and those practicing conservation farming was not big. Lamourdia and Malo (2009) explains that the level of adoption is still very low and that the total area of coverage could be estimated to be less than 1 percent of the continent's land.

Ndambo (2014) states that out of 75 million hectares land size of Zambia, 43 million hectares (58%) classified as medium to high potential for agricultural production, only 6.02 million (14%) agricultural land is currently utilised of which 1.1 million out of the estimated 14.1 million total population are agricultural households and 75 percent of the farming households are classified as small holder farmers cultivating between 0 ha to 5 ha. The above figures show that agricultural practice in Zambia is still very low considering the number of hectares of land being utilised for agricultural purposes. Further still, in reference to figure 3 on page 18, CA as of 2010 was only being practiced on 40 000 hectares out of 6.02 million hectares. This shows that the adoption of CA in Zambia is still low this supports the finding from the study that the mind-set of the farmers had not changed.

The above finding is in line with Lamourdia and Malo (2009) who explain that farmers traditionally believe in working their soils because it is believed that working the soil buries weeds as well as seeds, mineralizes nutrients, breaks soil compaction, aerates the soil and creates a loose bed, suitable for sowing crops. While some of these assertions may be individually true, collectively, they lead to an overall impoverishment of soil quality that is unsuitable in the medium to long term both from an economic and environmental point of view. Farmers believe that fields should always be clean as crops grow health in clean fields and it is also well accepted that a clean farm is synonymous with hard work and is the opposite of laziness. This finding is in agreement with FAO (2010) contention that for many people (farmers, extension and policy makers) crop growing is synonymous with ploughing, as good agronomic practice has meant, in the past, keeping fields very clean.

What needs to be realised is that it is not easy to change the mind-set of people because they need to be convinced that the change is necessary and beneficial. In this case the farmers in Ngwezi settlement scheme have tested and tried out ploughing and they have become experts in the method. Hence, for them to believe that the clean seedbeds are part of the cause of soil degradation and yield reduction is difficult, but to abandon the method is even harder thus, they need to be led in the process of transformation.

Mezirow (2000: 8) defined transformative learning as:

... the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of minds, mind sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action. Transformative Learning involves participation in constructive discourse to use the experience of others to assess reasons justifying these assumptions, and making an action decision based on the resulting insight.

It is therefore, important that the farmers in Ngwezi settlement scheme are led in this process of transforming their frames of reference in order to change their mind-set. Freire calls this process as the process of conscientisation where learners are involved in the process of changing the way they perceive and understand things. Moreover, Mezirow (1997) explains that transformative learning gives adult learners the ability to think autonomously which is important for full participation in a democratic society and for moral decision making, that is, to think as individuals. Thus, allowing learners to develop their own sense of meaning in the

world free from the accepted purposes, beliefs, judgments, values, and feelings that people received from their cultures, religions, family beliefs, personalities, and life experiences. The above contention contradict with the finding in that farmers are not allowed to discover and try out other methods other than the 2 accepted methods of ripping and pot-holing.

The study established that majority of the farmers in Ngwezi settlement make basins on less than one hectare and rip on average one hectare then what happens to the rest of the fields? It can be argued that farmers who under-go agricultural extension programmes practice what they learn but have not completely done away with the old traditional ways of farming because they use both methods. This finding contradicts Mezirow (1997) who explains that to foster transformative learning, participants would have to change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds and understanding.

Mezirow (2000) further clarifies that people can try other points of view, but not other habits of mind, transformations in habits of mind must come through changes in related points of view, which come through exploring other perspectives and hence, for transformation to occur people must learn to be open to other points of view, and go back and reconstruct what they know and how they know it. Unlike the farmers in Ngwezi settlement they have explored the three principles of CA as it was established that 100 per cent of the farmers practiced what they learnt, thus they have been open to other points of view, however, they have not reconstructed what they know and how they know it.

This finding contradicts Muvwema (2015) who did a study on transformative learning and found that community members in Nkonkola community embraced what they were learning and accepted the new methods they were taught and that their mind-set was changed by the intervention by Women for Change. This is in support of Pugh (2002) who state that transformative learning is learning that produces a significant impact, or paradigm shift, which affects the learner's subsequent experiences and is characterized by active use of an idea (when the individual acts on an idea and begins to see possibilities), expansion of perception (when the individual begins to perceive the world or phenomenon in a new way), and expansion of value (when the individual becomes deeply moved by this new way and so begins to perceive and view possibilities).

The study also established that for many farmers pot-holing was hard as it required a lot of labour and hence, most farmers practiced this method on 1 or 2 lima only and the highest was only half a hector. This finding can be explained by IFPRI (2002) that technology transfers must be appropriate to the agricultural season, agro ecological conditions, existing farming practices, and household knowledge, skills, and labour available. This is because when the technology transfer is not appropriate with the labour available farmers will fail to implement what is required of them. Farmers in Ngwezi settlement scheme fail to practice pot-holing on big portions of land because the method is strenuous hence, very few farmers use the method.

The study further established that ripping was expensive and with the increase of fuel prices in 2016 the charge for ripping raised to 370 Kwacha per hector. The lead farmers and follower farmers explained that considering the economic status of majority of the farmers this proved to be a challenge because most farmers could not manage to hire a tractor on that price. The lead farmers and follower farmers hence, suggested that FAO should help farmers by re-introducing subsidies on tractor hire. This finding is in agreement with Lamourdia and Malo (2009) who clarify that the lack of subsidies and efficient incentives in a context of high poverty rate in rural areas does not create favourable environment for the adoption of conservation agriculture practices. Similarly, Swanson, Bentz and Sofranko (1998) state that the ability of farmers to incorporate a technology or technological package into a farming system has economic implications in that the farmers' resource base, both human and financial, must be considered. That is to ask, do farmers have the financial resources to purchase the inputs to derive the benefits from the technology? Will this technology require the hiring of additional labour, and if so, is it available and affordable?

The study further revealed that the extension officers do not consider the different soils in the settlement and the different needs. The Lead farmers and follower farmers explained that the soil in the settlement was different in the different zones and that what can grow in one zone in the other it may not. Farmers further mentioned that they were all given one type of seed and they were not asked on what they wanted to plant. This finding is in support with Oladele and Sakagami (2004) who noted that among other challenges facing extension include becoming truly responsive to local conditions and concerns. This thought that is also shared with Garry (2003) who wrote on the 'Somewhat Flawed Theoretical Foundation of the Extension Service'.

The study further established that lead farmers were not meeting regularly with the extension officers and that they did not remember when last they met with their extension officers. The extension officers also explained that they had challenges in regard to transportation because there were no houses for extension officers in the settlement. The lead farmers further expressed that they were only given 10 to 20 liters of fuel per month and this made it challenging for them to visit the farmers.

The study established that among the challenges that farmers faced was that some of the follower farmers were not in any cooperatives. The lead farmers and follower farmers indicated that cooperatives had an accepted number of members and that those who were left out could not come up with new cooperatives because the settlement had a limited number of cooperatives. However, according to the FISP guidelines (2012), for a small scale or emerging farmer to be eligible to access inputs, they have to belong to a Cooperative. This means that those who were not in cooperatives had no access to inputs and this was challenging to farmers as they had to source for the inputs on their own.

The finding contradicts CSPR (2011) who did a study on 'An Assessment Of the Implementation and Viability Of the Farmer Input Support Program In Zambia' and the findings show that all farmers regardless of whether they were capable of providing inputs for themselves or not, have been accessing the subsidized inputs. Lamourdia and Malo (2009) explained that access to credit is one way to improving farmer access to new production technology and increase productivity as farmers' ability to purchase inputs such as improved seed and fertilizer is particularly important. If appropriate technology is available but not being used by farmers, then the technology becomes unnecessary. This finding is in agreement with Oladele and Sakagami (2004) who explain that farmers need inputs to increase production, but access to these is often poor in less developed countries.

The study also established that weeding is among the challenges that farmers face. The lead farmers and follower farmers mentioned that farmers were overwhelmed with weeds in their fields, as ripping and pot-holing encourage no turning of soils in fields. The lead farmers and follower farmers explained that most of the farmers lack enough resources to buy the needed weed killers and that some of the farmers did not have the know-how on how to apply these weed killers. The finding is in support with FAO (2010) who explains that weeds and weeding have been an issue even in conservation farming systems and this is mostly

attributed to very limited weed control or management technologies available to smallholder farmers.

The argument has been that experience show that weeds decline after a few years under no till especially as factors such as soil cover take effect. However, after these years farmers would have abandoned the practice if there was no solution hence, farmers go back to conventional farming as they are in no capacity to risk crop failure even just for one year. With regard to the above finding Lamourdia and Malo (2009) also identified the proliferation of weed species as one of the main setbacks to conservation agriculture noted that the move from ploughing to no-till or minimum till will increase dependence on herbicides in the first years as the elimination of ploughing, which plays a role in controlling weeds, initially increases weed infestation.

The extension officers explained that farmers were encouraged to begin the land preparation in the fields just after harvesting their crops. However, the lead farmers and follower farmers argued that their animals graze from the same fields, hence, when the fields are prepared just after harvesting the lines and get buried up making their work difficult. This means that when the rain season begins farmers need to dig holes and rip in the fields again. Lamourdia and Malo (2009) state that in CA, winter weeding and prevention of weeds from seeding helps to reduce the seed bank reservoir in the soil and thus subsequently reduces weed pressure in CA. Farmers often do not appreciate the importance of winter weeding, and may also be reluctant to carry it out because of labour constraints.

Summary

This chapter discussed findings on the study a transformative learning perspective analysis of the agricultural extension programmes in Ngwezi settlement in Mazabuka District. From a transformative learning perspective the process of developing the curriculum has to be participatory involving all stakeholder in order to meet the real needs of the beneficiaries. However, the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme were found to be non-participatory. As a result there was no feeling of ownership of programmes by the follower farmers and hence, many farmers withdrew from the programmes.

The study also discussed on the instructional methods used in Ngwezi settlement scheme. Considering the levels of learner involvement in these methods the researcher discovered that the lecture format and demonstration have low learner involvement as the facilitator is actively directing the lessons. On the other hand, the discussion method and problem-solving groups have high learner involvement as learners contribute through asking questions and making contributions and as such direct the learning process. Freire and Mezirow propose for learner centred, participatory and interactive methods for transformative learning, as adult learners learn best when they actively participate in the learning process.

The study also revealed that the farmers argued that their yields had improved and this motivated the farmers to continue with the programmes on extension. However, the extension officers stated that majority of the farmers had not improved because there was no difference between those practicing conservation agriculture and those who were practicing traditional methods. The farmers explained that they were facing a number of challenges and these challenges were that it was challenging to prepare fields in winter, pot-holing is hard, ripping is expensive, weeds are overwhelming, local concerns and conditions are not taken into consideration, some farmers were not in cooperatives and extension officers were not meeting with the farmers regularly. These factors limit the actualisation of the learners in Ngwezi settlement scheme hence, affecting the transformation of farmers.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion and recommendations of the study based on the findings and discussions on a transformative learning perspective analysis of the agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District. The objectives of the study were to:

- a) To examine the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme.
- b) To assess the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme.
- c) To determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme.

6.2 Conclusion

The first objective and research question were both answered. The study concluded that the process of developing the curriculum for agricultural extension programmes in Ngwezi settlement scheme was non-participatory because development is for man, by man and of man and hence, man should be actively involved in his own development.

The nature of the agricultural extension programmes in Ngwezi settlement scheme has affected transformation of the farmers in that the extension officers, lead farmers and follower farmers feel these are FAO programmes and not theirs. Hence, the farmers have not taken ownership of the programmes and they are not affected whether these programmes fail or not because to them it is FAO as an organisation that will fail and not them. This is why many farmers were withdrawing from the programmes as they felt that they had nothing to lose. The study concludes that adult learners will not value programmes that they feel are being imposed on them as learners will withdraw from learning experiences when they feel that their needs are not being met.

Furthermore, the study established that lead farmers and follower farmers needed new lessons to be introduced to help them improve in their farming activities. This was seen by the researcher as a gap that was created due to the fact that the owners of the programmes were

left out from participating in the process of developing the curriculum and as a result, their real needs were not taken into consideration. The study concludes that no one can develop another individual except that individuals develop themselves seeing that real needs are only known by people experiencing a particular situation.

The second objective set out to assess the instructional methods of the agricultural extension programmes in Ngwezi settlement scheme. The study concluded that the lecture format, discussions and demonstration plots were the common methods of delivering content to participants in Ngwezi settlement scheme. In considering the levels of learner involvement in these methods the researcher discovered that the lecture format and demonstration have low learner involvement as the facilitator is actively directing the lessons and the participants are passive.

On the other hand, the discussion method and problem-solving groups have high learner involvement as learners contribute through asking questions and making contributions and as such direct the learning process. The study concludes that the instructional techniques to be used in agricultural extension programmes should be learner centred, participatory and interactive in order to make the programmes transformative. The study concludes that adult learners learn best when they actively participate in the learning process and the educators need to create an environment in which critical reflection and questioning norms are supported and encouraged.

The third objective set out to determine the contextual factors that influence the transformation of farmers who undergo agricultural extension programmes in Ngwezi settlement scheme. The study established that farmers were motivated to participate in the agricultural extension programmes because of their yields that had improved and that through the improved yields they were able to meet the basic needs (paying school fees, providing food for the family, building modern houses and many others), hence, improving their living standards.

However, the study concluded that there was no much difference between those practicing conservation agriculture and those practicing conventional farming as the mind set of farmers had not changed as they had not completely done away with the traditional methods of farming. This was because for many people (farmers, extension and policy makers) crop growing is synonymous with ploughing, as good agronomic practice has meant, in the past,

keeping fields very clean. People can try other points of view, but not other habits of mind, transformations in habits of mind must come through changes in related points of view, which come through exploring other perspectives and hence, for transformation to occur people must learn to be open to other points of view, and go back and reconstruct what they know and how they know it. The farmers in Ngwezi settlement have explored the three principles of CA, however, they have not reconstructed what they know and how they know it. Transformative learning is learning that produces a significant impact, or paradigm shift, which affects the learner's subsequent experiences.

The study concluded that in order to foster transformative learning learners must be understood in context as learning is dependent not only on the specific subject matter to be acquired but also on the ways in which the social context informs and influences how people come to define the meaning and nature of the content. This is because actualisation is constrained by the presence of coercive forces or factors within people's personal and socio-cultural contexts, as such, the coercive forces limit the degree to which people can be who or what they are. The study therefore, discovered the following factors as major forces that limit transformation of farmers in Ngwezi settlement scheme: pot-holing is hard; ripping is expensive; influent visits from camp officers; weeding; and lack of cooperatives.

6.3 Recommendations

In light of the findings of the study, the following recommendations are made:

1. The Ministry of Agriculture should make a deliberate policy to ensure that projects and programmes intended to bring about development apply transformative learning principles. This is unlike what obtained in the study where the extension programmes fell far of what is recommended for transformative learning.
2. The Ministry of Agriculture through the department of agricultural extension should be using instructional techniques that are learner centred, participatory and interactive. Unlike what obtained in the study where lecture techniques and demonstration plots were used.
3. Adaptive research is required to tailor CA principles and practices to local conditions and concerns and this should be done in collaboration with local communities and other stakeholders. This is unlike what obtained in the study where participants in

Ngwezi settlement were not involved in selecting content and inputs of the programmes.

4. In order for farmers to have access to inputs they need to be in cooperatives. The government therefore through the Ministry of Agriculture, needs to increase the number of cooperatives and ensure that all farmers belong to cooperatives. This is unlike what obtained in the study where some farmers were not in cooperatives.
5. The Ministry of Agriculture should make a deliberate policy to ensure that all developmental programmes are funded to ensure that farmers afford the new technologies being introduced, unlike what obtained in the study where farmers found conservation agriculture principles to be expensive to implement.
6. The extension officers need to be living within the settlement in order to meet the real needs of the farmers, hence there is need for the government to urgently increase funding to the Ministry of Agriculture to improve the effectiveness of the extension system in Zambia. This is unlike what obtained in the study where extension officers were not living within the settlement.

6.4 Suggestions for Future Research

This study was focussed on analysing the agricultural extension programmes in Ngwezi settlement scheme in Mazabuka District from a transformative learning perspective. The study concentrated on the teaching and learning activities of the agricultural extension programmes in Ngwezi settlement scheme. During the study it was discovered that farmers felt that the agricultural programmes under CFU were better than the programmes under FAO. The following gaps were therefore, discovered that would require for further research:

1. A comparative analysis of the CFU and FAO agricultural programmes in Ngwezi settlement scheme in Mazabuka District. The rational is to enable FAO learn how CFU is implementing the CA programmes seeing that they are doing better than the FAO programmes run by extension officers.
2. A comparative analysis of the CA and traditional methods of farming in Southern province. The rational is to make CA more sustainable as conventional farming seeing that conventional agriculture has existed for a longer time.

6.5. Summary

Chapter six has provided a conclusion and recommendations of the study. The conclusion was based on the three objectives of the study; while the recommendations were drawn from the findings. The study concluded that the process of developing the content for agricultural extension programmes in Ngwezi settlement scheme was non-participatory. It was revealed that despite the relevance of the programmes in Ngwezi settlement scheme farmers still needed new lessons to be introduced. It was therefore, recommended that all stakeholders in agricultural extension programmes contribute to curriculum development.

The study further concluded that the lecture format, discussions and demonstration plots were the common methods of delivering content to participants in Ngwezi settlement scheme. The lecture format and demonstration have low learner involvement as the facilitator is actively directing the lessons. On the other hand, the discussion method and problem-solving groups have high learner involvement as learners contribute through asking questions and making contributions and as such direct the learning process. The study concluded that instructional methods that are to be used in delivering content have to be learner centred, participatory and interactive methods for transformative learning, seeing that adult learners learn best when they actively participate in the learning process.

The study also concluded that the yields of the farmers had improved and this motivated the farmers to continue with the programmes on extension. It was concluded that the farmers had not transformed as to shift from traditional methods to conservational farming. The farmers explained that they were facing a number of challenges and these challenges were that it was challenging to prepare fields in winter, pot-holing is hard, ripping is expensive, weeds are overwhelming, local concerns and conditions are not taken into consideration, some farmers were not in cooperatives and extension officers were not meeting with the farmers regularly. It was recommended therefore that the Government increases funding to the Ministry of Agriculture and Livestock.

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APPENDICES

Appendix i: INTERVIEW GUIDE FOR THE OFFICERS IN-CHARGE OF AGRICULTURAL EXTENSION PROGRAMMES IN THE MINISTRY OF AGRICULTURE AND LIVESTOCK

Research Title: A transformative learning perspective analysis of the agricultural extension training programme in Ngwezi settlement in Southern province.

Dear Respondent

The researcher of this study is a postgraduate student at the University of Zambia in the School of Education pursuing a Master's degree of Education in Adult Education.

You have been purposively selected to take part in this study. Therefore, you are kindly requested to participate in this research by responding to the questions out lined in this interview guide. Be assured that the information you will provide will be confidential and will be used for academic purposes only.

1. What is your position in this Ministry?

2. How long have you served in this capacity?

3. What role do you play in developing the farmers?

4. What is your understanding of agricultural extension?

5. What is the teaching content in agricultural extension?

6. Who determines the curriculum in agricultural extension?

7. What factors are taken into consideration when developing an agricultural extension curriculum?-----

8. What are the focus areas of agricultural extension?

9. What instructional methods of teaching are used in agricultural extension programmes?

10. How is the teaching and learning activity in agricultural extension done?

11. How is the attendance of participants in the agricultural extension programme?

12. What affects participants' attendance in agricultural extension programme?

13. How is the economic power of participants in agricultural extension programme?

14. When do participants access farm in-puts such as fertilizer, loans?

15. How do participants access the in-put on time?

16. What needs to be done to improve the situation in agricultural extension?

Thank you for your participation.

Appendix ii: RESEARCHER ADMINISTERED QUESTIONNAIRE FOR AGRICULTURAL EXTENSION PROGRAMMES PARTICIPANTS

Research Title: A transformative learning perspective analysis of the agricultural extension training programme in Ngwezi settlement scheme in Southern province.

Dear Respondent

The researcher of this study is a postgraduate student at the University of Zambia in the School of Education pursuing a Master’s degree of Education in Adult Education.

You have been purposively selected to take part in this study. Therefore, you are kindly requested to participate in this research by responding to the following questions out lined in this interview guide. Be assured that the information you will provide will be confidential and will be used for academic purposes only.

1. What do you learn in the agricultural extension programme?-----

2. How do you participate in designing the content of the programme? -----

3. How relevant is what you learn to your daily work and how has it helped you in your farming experience?-----

4. Is there anything that you think you are not learning that you think you need to learn to improve your knowledge and skills in farming? -----

5. What can you contribute to the current content of the programme? -----

6. How does the programme content provide you with accurate and complete information that you need?-----

7. Do you have equal opportunities to participate during the lessons?-----

8. How are the facilitators open to alternatives from participants?-----

9. What opportunity do you have to practice what you learn in the extension programme?-----

10. How do you implement what you learn on your farms?-----

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11. How do learners in the extension programme learn from each other?-----

12. What method of teaching and learning is used in the extension programme?-----

13. Do you always manage to attend the agricultural extension programmes? -----

14. What affects or prevents you from attending the extension programmes?-----

15. How do you manage to access the farm inputs that are needed?-----

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16. What should be improved on in the agricultural extension programme?-----

Thank you for your participation.

Appendix iii: Observation checklist for the study on ‘‘A transformative learning perspective: An analysis of the agricultural extension training programme in Ngwezi settlement scheme in Southern province.’’

Elements	Observation
Content	
Types of activities	
individual participation	
Group participation	
Attendance	
Frequency of individual attendance	
Accurate and complete information	
Openness to alternative perspective	
Ability to reflect critically	
Ability to assess arguments	
Implementation levels	