

بسم الله الرحمن الرحيم

**Sudan University of Science and Technology**

**College of Graduate Studies**



## **Evaluation of livestock Extension Radio Programs in River Nile State-Sudan**

تقويم برامج الارشاد الحيواني الإذاعية في  
ولاية نهر النيل - السودان

**A thesis submitted for partial fulfillment of the  
requirements for the master degree in animal  
production in the tropics**

**Prepared by: Ekhlass Ahamed Mohamed Salim**

**Supervisor: Dr. Hassan Abdelnabi Allajabu**

**February (2020)**

## الإستهلال

بسم الله الرحمن الرحيم

قال تعالى:

فَاسْتَجَابَ لَهُمْ رَبُّهُمْ أَنِّي لَا أُضِيعُ عَمَلَ عَامِلٍ مِنْكُمْ مِنْ ذَكَرٍ أَوْ أُنْثَىٰ ۖ  
بَعْضُكُمْ مِنْ بَعْضٍ ۖ فَالَّذِينَ هَاجَرُوا وَأُخْرِجُوا مِنْ دِيَارِهِمْ وَأُوذُوا فِي  
سَبِيلِي وَقَاتَلُوا وَقُتِلُوا لَأُكَفِّرَنَّ عَنْهُمْ سَيِّئَاتِهِمْ وَلَأُدْخِلَنَّهُمْ جَنَّاتٍ تَجْرِي مِنْ  
تَحْتِهَا الْأَنْهَارُ ثَوَابًا مِنْ عِنْدِ اللَّهِ ۖ وَاللَّهُ عِنْدَهُ حُسْنُ الثَّوَابِ

صدق الله العظيم

الآية (195) سورة آل عمران

## DEDICATION

I honorably dedicate this work to my beloved family  
that sincerely encouraged me and shouldered all  
endeavors to bring this work to reality.

I dedicated also to the pure spirit of my mother

Thanks to the valuable support of that man who I carry his name  
with pride of my father

Thanks to all my sisters

To My brothers who are source of strength and inspiration

To all my friends and

Everyone who supported and helped through the duration of the  
study from beginning to end

To you all I owe millions thanks and appreciation

## ACKNOWLEDGMENTS

All thank and praise are due to Allah who gave me health and strength that enable me to do this study

I express my deep appreciation and gratitude to my supervisor: Dr. Hassan Abdelnabi Allajabu (College of Animal Production Science and Technology) who gave me a lot of knowledge and consultancy during all stages of this thesis

Also my appreciation to my teacher Dr .Alhadi Matar , for his continuous help, advice and encouragement .

I am also grateful to the members of all the staff of the University of Khartoum library and all the staff of College of Animal Production Science and Technology library for their help

I wish to extend my grateful acknowledgment to my family who supported me through all stages of the study

Praise and respect should be attributed to the great people who did not deny me any advice, guidance through the research term.

Last, my thanks to all who have assisted me

## **ABSTRACT**

This study aimed at evaluating the livestock extension radio programs on livestock farmers in River Nile state. Data were collected from 90 respondents randomly selected from three localities (Aldamar, Atbara and Barbar) by using the simple sample technique. The questionnaire was used to collect primary data, while the secondary data was gained from references, sources research, reports , and internet . The data was statistically analyzed by using the SPSS application (statistical package for social science) to calculate the frequencies and Chi –square).

The results of the study showed that the more than half of respondents (55.6%) attended the extension capsules of radio program, while (55.5%) followed the veterinary journal extension program, and (41.1%) of the respondents relied mainly on extension radio programs to obtain agricultural information on animal health and husbandry, and (61.1%) of respondents reported that the broadcasting time of the studied extension radio programs is not suitable.

The results of the Chi Square analysis also showed that there was no significant relationship between the socio-economic characteristics of the respondents (educational level, age, type of activity, herd types and experience)) and the follow-up for morning capsules. While the herd size significantly affected the follow-up for veterinary journal extension radio program.

The study recommended changing the broadcasting time, and re-broadcast the program at different times during the week.

## ملخص الدراسة

هدفت هذه الدراسة الي تقييم البرامج الازاعية للإرشاد الحيواني ولاية نهر النيل. تم جمع البيانات من عدد 90 مبحوث تم اختيارهم عشوائيا من ثلاث محليات (الدامر، عطبرة ومحلية بربر) باستخدام أسلوب العينة العشوائية البسيطة. تم تصميم استبيان لجمع البيانات الأولية، بينما تم جمع البيانات الثانوية من عدة مصادر تمثلت في المراجع والتقارير والشبكة العنكبوتية للمعلومات. تمت معالجة البيانات احصائيا باستخدام البرنامج الاحصائي SPSS لحساب التكرارات والنسب المئوية ومربع كاي .

ابانت نتائج الدراسة ان غالبية المبحوثين (55.6%) قد تابعوا برنامج الكبسولات الارشادية، بينما الذين تابعوا المجلة البيطرية بلغت نسبتهم (55.5%)، بينما (41.1%) من المبحوثين يعتمدون بصورة أساسية علي البرامج الازاعية الارشادية للحصول علي المعلومات الارشادية المتعلقة بصحة ورعاية الحيوان وأشار (61.1%) من المبحوثين الي عدم ملاءمة زمن بث البرامج الازاعية الارشادية. اشارت نتائج اختبار مربع كاي لعدم وجود علاقة معنوية بين بعض الخصائص الاجتماعية الاقتصادية (المستوي التعليمي، العمر، نوع النشاط، نوع القطيع وسنوات الخبرة) للمبحوثين ومتابعتهم لبرنامج الكبسولات الصباحية والمجلة البيطرية، في حين ابانت النتائج وجود علاقة معنوية بين متابعة المجلة البيطرية بحجم القطيع.

اوصت الدراسة بتغيير زمن بث البرنامج الارشادي، والعمل علي إعادة البث في ازمان مختلفة علي مدار الاسبوع

## LIST OF CONTSINS

No	Subject	Page numbers
	INITIATION	I
	DEDICATION	II
	ACKNOWLEDGMENTS	III
	ENGLISH ABSTRACT	IV
	ARABIC ABSTRACT	V
	LIST OF CONTENTS	VI
	LIST OF TABLES	IX
	LIST OF FIGURES	XI
<b>CHAPTER ONE</b>		
<b>Introduction</b>		
1 - 1	Introduction	1
1 - 2	Research Problem	2
1 - 3	Objectives of the research	3
1 - 4	Research questions:	3
1 - 5	Importance of the research	4
<b>CAPTER TWO</b>		
<b>Literature Review</b>		
2-1	Extension	5
2-1-1	Development of extension	5-6
2-1-2	Definition of Extension	6-7
2-1-3	The concept of extension	7
2-1-4	Principles of Extension Education	8
2-1-5	Philosophy of extension education	9
2-1-6	Purpose and Significance of Livestock extension education	10
2-1-7	Types of extension	12

2-1-7-1	Agricultural extension	12
2-1-7-2	Non-agricultural extension	12
2-1-8	Characteristics of Extension Education	12
2-1-9	Objectives of Extension Education	13
2-1-10	Levels of extension objectives	15
2-1-11	Extension Educational Process	15
2-2	Extension methods	16
2-2-1	Types of extension methods	16
2-2-1-1	Individual contact methods	17
2-2-1-2	Group contact methods	19
2-2-1-3	Mass Media Contact Methods	20
2-3	Challenges facing Livestock Extension	24
2-4	Brief History of livestock extension in Sudan	26
2-5	Livestock extension in River Nile state	26
2-5-1	Extension methods in the state	27
2-6	Adoption of innovations	28
2-6-1	Diffusion and Adoption of Agricultural Innovations	28
2-6-2	Factors effecting the deployment of innovations	33
2-6-3	Role of extension in the transfer and adoption of technology	33
2-6-4	Strategies to Diffuse Innovations among Resource Poor Farmers	33
	<b>CAPTER THREE</b> <b>Methodology of research</b>	
3-1	Study area	35



3-2	Research population	36
3-3	Sampling	36
3-4	Data collection	36
3-5	Data analysis	36
	<b>CAPTER FOUR</b>	37
	<b>Results, Discussion and Interpretation</b>	
	<b>CAPTER FIVE</b>	
	<b>Conclusion and recommendations</b>	
5-1	Conclusions	52
5-2	Recommendations	53
	References	54
	Appendices	

## LIST OF TABELS

No	Subject	Page numbers
3 -1	The numbers of livestock in the River Nile state	35
4 -1	Frequency distribution of respondents according to educational level	37
4 - 2	Frequency distribution of respondents according to Social status	37
4 - 3	Frequency distribution of respondents according to Family size	38
4 - 4	Frequency distribution of respondents according to Age	38
4 - 5	Frequency distribution of respondents according to type of activity	39
4 - 6	Frequency distribution of respondents according to herds types	39
4 - 7	Frequency distribution of respondents according to their experiences	39
4 - 8	Frequency distribution of respondents according to System of breeding and production	40
4 - 9	Frequency distribution of respondents according to profitability gained from breeding and production	40
4 - 10	Frequency distribution of respondents according to herd size	41
4 - 11	Frequency distribution of respondents according to flock size of birds	41
4 - 12	Frequency distribution of respondents according to their degree of reliability on various extension means and methods:	42
4 - 13	Frequency distribution of respondents according to their follow-up to the livestock extension radio program	43

4 - 14	Frequency distribution of respondent saccording to The extent to which state radio is generally followed by respondent	44
4 - 15	Frequency distribution of the respondents which follow-up morning capsules program & veterinary journal program	44
4 - 16	Frequency distribution of respondents according to adequacy of programs time	45
4 - 17	Frequency distribution of respondents according to covered their areas of interest	45
4 - 18	Frequency distribution of respondents according to their opinion about the contribution of radio programs in knowledge level	46
4 - 19	Frequency distribution of respondents according to their opinions about the contribution of radio programs to increasing their production	46
4 - 20	Frequency distribution of respondents according to degree of benefit from livestock radio programs	47
4 - 21	Frequency distribution of respondents according to manner of listening to the livestock extension radio programs	47
4 - 22	Frequency distribution of respondents according to which is the best direct or software programs	48
4 - 23	Chi-square test for the relation between the follow-up for morning capsules extension radio program and some of the respondents' socio-economic characteristics	49
4 - 24	Chi-square test for the relation between the follow-up for veterinary journal radio program and some of the respondents' socio-economic characteristics	50

## LIST OF FUGERS

<b>No</b>	<b>Subject</b>	<b>Page</b>
2-1	Classification of objectives of extension	14
2-2	Shows the relationship of the extension with relevant institutions	27
4-1	Showing The best extension methods for respondents	43

# CHAPTER ONE

## Introduction

### 1-1 Introduction:

The advent of extension and growth has preceded great developments in scientific research and technology. This has led to the thinking of advice that transfer these developments to the real producer where schooling was not able to do this job because many producers not go to schools, therefore extension is an indirect result of scientific and technological development. The need to increase production has become a necessity today, so we find that all developed countries have extension services. Extension work depends primarily on people as an educational work aimed at educating producers and beneficiaries in persuasion and following democratic methods to improve living condition and develop their daily lives by relying on themselves to exploit available resources economically. In order to raise the level of productivity in farm work to achieve the following ( raise the efficiency of agriculture and animal production – further improve the financing and marketing aspects – increase the income of farmers and raise their standard of living ).(FAO 1972)

Broadcasting ranked as the most popular means of disseminating information, regardless of the continent. It is very appealing because of some distinguishing features of interactivity, its capacity to provoke dialogue and to solicit the participation of local population with lower production costs and extreme versatility. Broadcasting programmes are usually timely and capable of extending messages to the audience no matter where they are as long as they have a receiver with adequate supply of power. The absence of such facilities as road, light and water are no hindrance to radio. Similarly, such obstacles as difficult topography, distance, time and socio-political exigencies do not hinder the performance of radio. He further observed, that illiteracy is no barrier to

radio messages since such messages can be passed in the audience own language (Omenesa (1997). There is no structured or formal system of extension of improved livestock technology or husbandry to smallholder or commercial livestock farmers. Smallholders rely on traditional farmer-to-farmer exchange of information, and information from traders, medicine and feed outlets and CAHWs. Commercial farmers rely on their own sectoral contacts, veterinarians, feed suppliers and larger farmers. All these made the broadcasting major role in the extension of livestock.

### **1-2 Research Problems:**

The number of livestock producers in the River Nile State is estimated at about ( 9018 ) They are located in sprawling geographical areas of the vast state. The general directory of extension and technology transfer is the responsible for extension work in the field of livestock in the state suffering from lack of means of movement. This makes it difficult to reach large number of them, consequently there was a high reliance on extension radio programs to transfer all information related to animal husbandry and health , represented in the Morning capsules program and the Veterinary magazine program which lasted for (33) years without scientific assessment.

### **1 -3 Objectives of research:**

The main objective:

To evaluate the livestock extension radio programs in River Nile State

The specific objectives:

1. To determine the different sources of extension information that the respondents depend on .

2. To determine the degree of follow-up for extension radio programs among the respondents.
3. To determine the degree of coverage of extension radio program
4. To determine the contribution of livestock extension radio programs in producers skills and knowledge.

#### **1-4 Research questions:**

1-What are the livestock information sources that the respondents depended on?

2-What is the respondent's degree of follow-up for livestock extension radio programs

3-What is the contribution of livestock extension radio programs in producer's skills and knowledge?

#### **1-5 Importance of the research:**

The radio is considered as the one of the most important extension methods used to teach the livestock producers due to its accessibility and affordability. The one of the weak point of radio programs the is no feedback. For this reason there is a necessity to evaluate the impact of livestock extension radio programs in River Nile State.

Relative Studier:

Many studies have investigated about the agricultural extension radio programs in different regions of the world, here below are some of these studies:

- Haider (2014) studied the role of local radio programs in small scale farm extensions in Pakistan. The study revealed that (94%) farmers listen local radio in rural areas, and farmers adopt new farm practices through the information provided by local radio, also the study states that radio

agricultural programs helps farmer to adopt new information and apply new methods and practices in their farms

- Girma et al., (2017) studied the perceived preference of radio as agricultural information source among smallholder farmers in Uganda. The study revealed that respondents tune into the radio from 3 – 6 hours daily with no significant difference among male and female listeners. Radio shows such as educational programs related to health and agriculture, news and entertainment featured among the favorite programs.
- A. K. Ango et al., (2013) investigated the role of radio agricultural programs on awareness creation among farmers in Zaria Kaduna State, Nigeria. The study revealed that most of the farmers obtained agricultural information through radio agricultural programs. The chi-square analysis depicts that there is significant relationship between the type of radio agricultural programs aired and the knowledge gained by the farmers.
- Farshad et al., (2011) investigated the role of radio and television programs on the improvement of agricultural extension. The article revealed that rural radio can be used to improve the sharing of agricultural information by remote rural farming communities. A format that combines a drama performed by local actors with corresponding thematic discussions is popular amongst farmers listening to agricultural extension radio programs



# CHAPTER TWO

## LITERATURE REVIEW

Livestock production is an important pathway for increasing the income of small farmers and landless labourers. The livestock extension education plays an important role to empower the farmers with appropriate technological knowledge and skills through various extension education and training programmes. The concept of extension with a focus on livestock extension, development process and goals, extension approaches, communication and adoption of technologies and various livestock development programmes providing a wholestic understanding of livestock extension education (Venkatasubramanian,2019)

### **2-1 Extension:**

#### **2-1-1 Development of extension :**

James Stuart was considered as the father of University Extension for taking first practical steps and taking lectures to women's associations and working men's clubs in England in 1867-68. The term 'extension education' was first introduced in 1873 by Cambridge University to describe a particular educational innovation .This was to take the educational advantages of the universities to the ordinary people, where they lived and worked. The term 'extension' was first coined in England, not in America as often thought.(Addison 1972 )

Oxford and Cambridge universities in the United Kingdom firstly used extension as a term to explain adult education programs in 1867. These programs assisted in expanding the message of the universities outside of campus's borders and entering into the nearby communities. Extension as a term that was officially adopted in the United States in the 1860's. Later on,

research activities were included in 1887 with extension activities furthermore started in the 1890. Agricultural extension activities were officially called advisory services in the United Kingdom at the beginning of the 20th century. The majority of the European countries also used this same term. However, in the United States and Canada agricultural extension activities were called extension services.

The term that the donor agency used was commonly carried to the developing countries where the donor agencies played a part of building public agricultural extension institutions. For instance, in the 1960 and 1970 the United States Agency for International Development (USAID) was involved in setting up agricultural universities in addition to research and extension systems in many developing countries. Even nowadays, numerous agricultural extension systems still have the term extension in them. (Swanson and Rajalahti (2010).)

### **2-1-2 Definition of Extension:**

Extension has a wide range of definitions; it is defined by many scholars in different parts of the world – Kelsey and Harne (1963) stated that Extension work is an out of school system of education in which adult and young people learn by doing. It is partnership between the Governments. And the people, which provides service and education designed to meet the people needs. Its fundamental objective is the development of the people. (Jitendra 2000) as cited by “Extension education is an education bringing a desirable change in behavior (knowledge, skills and attitudes) of rural people to improve their social, economic and psychological status”. (Anderson and Feder 2004, Anandajayasekaram et al. 2008, Aker 2010) viewed extension as . Extension services that include transferring knowledge to farmers, advising and educating farmers in their decision making, enabling farmers to clarify their own goals and possibilities, and stimulating desirable agricultural developments. Traditional

public-sector extension services use a variety of extension programmes to overcome barriers to technological adoption without much success.

-Essentially extension services act as a bridge between scientists who strive to resolve problems in the practice of agriculture through research and the farmers who need the solutions. Innovative technologies and good practices can be translated to increased yields and improved food security only when it is properly communicated to farmers (Annie and Merle 2012).

### **2-1-3 The concept of extension:**

Extension as a concept has many definitions. They all state that extension is an educational process which is applied to rural people also highlight that extension is a procedure which happens over a long period of time, it is not just something that has one activity. (Oakley and Garforth 1985, 9–10).

-Concept means idea. The basic concept of extension is that it is education,. Briefly education can be defined as shaping of behavior or modification of behavior of the individual for adequate adjustment in the society by change in behavior means ,change in knowledge and understanding , skill and attitude .(Jitendra 2000 )

The duties of extension workers include introducing farmers at agricultural training courses into training programs on various agricultural subjects in order to provide them with information and knowledge about methods and techniques of agriculture, and, consequently, increase their production and income efficiency, improve their living, and raise the social and educational standards of rural life. Agricultural extension takes care of the youth and women in rural areas and enables them to develop their knowledge of various subjects concerning agricultural and social issues. Agricultural extension focuses on two main facets, (Bello 2008).

It deals with the behavior of rural people in terms of influencing them through education and the exchange of information. The aim is to assist the people in gaining livelihood, improving the physical and psychological level of living of rural families and fostering rural community welfare.

Agricultural extension is a link between farmers and the centres of agricultural research that serves to transfer innovations and new technologies in agriculture to farmers as well as transfer the results of the use of agricultural techniques and farmers' problems to agricultural research centers in order to find solutions for them.

The education is effective when it results in changes in all the behavioral components as specified following (Knowledge, Attitudes, Skills and Action) Leagans (1961):

#### **2-1-4 Principles of Extension Education:**

Principles of extension education are simple, easy, educative and moral. Generally principles of extension are as follows according to (Jitendra2000)

1. Principle of need and interest.
2. Principle of cooperation and participation.
3. Principle of cultural difference.
4. Principle of applied science and democratic approach.
5. Principle of learning by doing.
6. Principle of trained specialists.
7. Adaptability principles in use of extension teaching methods.
8. Principle of leadership.

9. Principle of whole family.
10. Principle of satisfaction.
11. Principle of evaluation.
12. Principle of neutrality.
13. Principle of encouragement.

### **2-1-5 Philosophy of extension education:**

Philosophy is the pursuit of wisdom, a body of general principles or laws in a field of knowledge. The philosophy of a particular discipline would furnish the principles of guidelines with which to shape or mould the programmes or activities relating to that discipline. The philosophy of extension education can be explained as expressed in the following:

- The individual is supreme in a democracy.
- The home is the fundamental unit in a civilization.
- The family is the first training group of the human race.
- The foundation of any permanent civilization must rest on the partnership of man and land (nature).

According to Ensminger (1957), Extension involves changing attitudes, knowledge and skills of the people. ,working with men and women, young people, boys and girls to answer their needs and wants, helping people to help themselves, principles of “Learning by doing” and “Seeing is believing” , development of individuals, their leaders, their society and their world as a whole. Working in harmony with the culture of the people, a two way channel and a continuous educational process.

The extension education philosophy is based on the hypothesis that rural people are intelligent, are interested in obtaining new information and at the same time

have a keen desire to utilize this information for their individual and social welfare. The basic philosophy is directed towards changing the outlook of man by educating him. Its primary aim is, therefore, to transform people by bringing about desired changes in their knowledge, attitudes and skills. (Venkatasubramanian,2019)

#### **2-1-6 Purpose and Significance of Livestock Extension Education:**

Is to complement local knowledge and to disseminate advice to farmers to enhance their productively and also extension provides their need of information on prices and markets, postharvest management (Ferroni and Zhou,2012) Livestock extension involves systematic and organized communication with livestock owners with a view to helping them in such a way that the livestock owners obtain a better insight into their present and future position as livestock owners;

- Acquire sufficient knowledge and skills necessary to increase production or reduce cost of production;
- Develop positive attitudes of livestock development
- Able to choose feasible and optimum objectives;
- Able to identify problems, look for solutions, solve the problems identified; and
- Evaluate the results within the farming system situation in which they are operating.

The subject matter delivered should be directly applicable to the livestock owners, which is necessary for livestock development. This could be accomplished by designing the training programme based on needs of the livestock owners. It is also equally important for the extension agencies to help

the development of leadership among the livestock owners. Development of appropriate local leaders helps the extension agencies in several ways.

Extension work in rural communities. Extension is essentially the means by which new knowledge and ideas are introduced into rural areas in order to bring about change and improve the lives of farmers and their families. Extension, therefore, is of critical importance. Without it farmers would lack access to the support and services required to improve their agriculture and other productive activities. The critical importance of extension can be understood better if its three main elements are considered:

#### KNOWLEDGE ~ COMMUNICATION ~ FARM FAMILY

Extension is not concerned directly with generating knowledge; that is done in specialized institutions such as agricultural research centres, agricultural colleges or engineering departments. Extension takes this knowledge and makes it available to the farm family. Rural extension, therefore, is the process whereby knowledge is communicated, in a variety of ways, to the farm family. This process is usually guided and supported by an extension agent who works at the programme and project level, and who is in direct contact with farmers and their families. To do this extension work, agents have to be trained in the different aspects of the extension process. One aspect of this training is giving the agent the technical or scientific knowledge required for the job. This is usually done during the agent's professional training; however, it is only one element in the process. The other two elements of the process are equally important. It is not enough for an extension agent to have technical knowledge; he must also know how to communicate this knowledge and how to use it to the benefit of the farm family. Training in extension, therefore, is an equally important aspect of the training of any agent who wishes to work with farmers (Oakley and Garforth 1985).

### **2-1-7 Types of extension:**

There is no one universal type of extension but a variety of activities and approaches which can be called extension. It has already been stated that since agriculture is the basis of a rural economy, agricultural extension is the most common type of extension to be found in rural areas. But the areas of knowledge and new ideas that farmers and their families require are not restricted to agriculture. There are other aspects of family life in which new knowledge and practices can lead to improvement. This extension, however, can take different forms of which as:

#### **2-1-7-1 Agricultural extension:**

Is presented by agricultural extension service. Farmers are also helped to maintain their agricultural production by providing the farmers inputs and services. Agricultural extension programs introduce the farmers a wide spectrum of topics for example from enhanced crop varieties and improved water management to pest control.

#### **2-1-7-2 Non-agricultural extension:**

Includes all the other types of extension which are not directly associated with agriculture or livestock production. However, these aspects are still essential to families in rural areas. These consist of for instance home economics, health, nutrition, population education and community development. (Oakley and Garforth 1985, 21)

### **2-1-8 Characteristics of Extension Education:**

(Jitendra 2000) reported the following points:-

Extension Education is-

1. Co-operative in nature,



2. Broader in scope,
3. Informal in nature,
4. Flexible in order to meet the needs,
5. Primarily concerned with teaching its clientele
5. Voluntary in participation, and
6. Family centred

### **2-1-9 Objectives of Extension Education:**

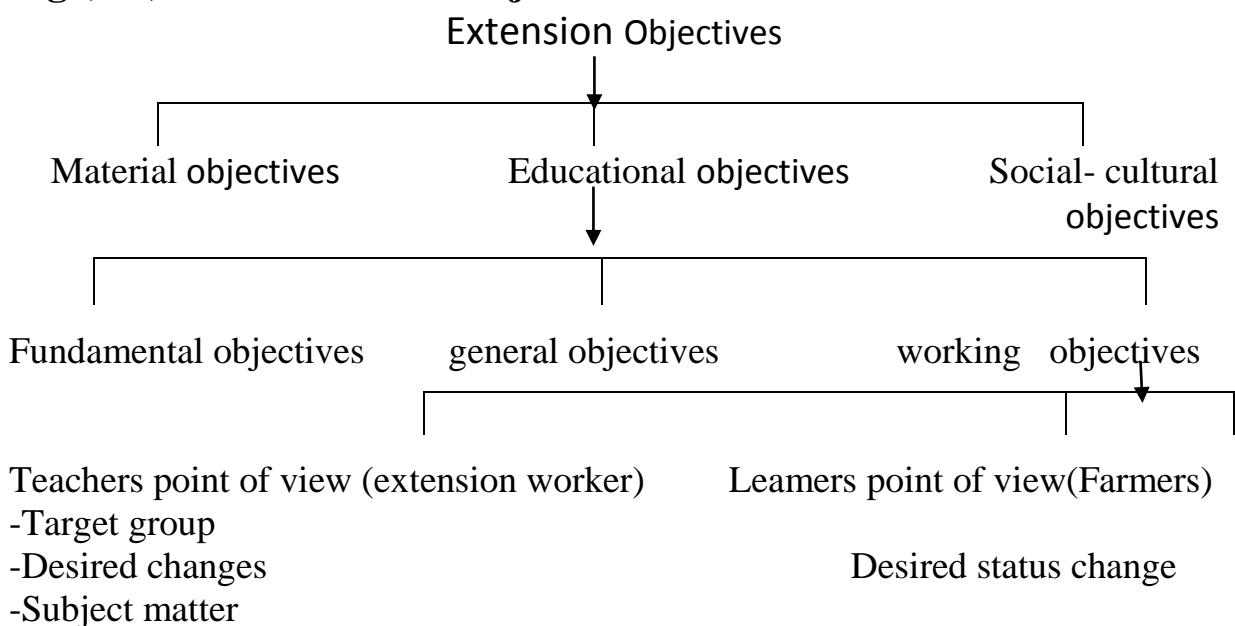
According to Jitendra 2000 .The main aim of Extension Education is to bring about all-round development of rural people. In this all-round development educational, social, economic and political developments are included. The first aim of Extension Education is to bring change in the behavior, in work capacity and in attitude in wider context. The second aim of Extension Education like social, economic and political change is automatically achieved by bringing about above mentioned educational changes. How to achieve this aim is known as objectives. In this context the objectives of Extension Education are as following:

- (1) To increase the net income of farmers by more production and proper marketing system.
- (2) To raise the standard of living of rural people
- (3) Development of rural areas
- (4) To increase the facilities for social, cultural and entertainment programmes for rural people
- (5) To develop rural leadership

- (6) To develop the feeling of self-dependence among rural people
- (7) To provide educational and health facilities in rural area
- (8) To develop feeling of patriotism and love for society by developing civic sense among rural people
- (9) To encourage rural people to participate in community program
- (10) To train rural youth for development works

- Objectives can be defined as expression of desired ends towards which our efforts are directed. According to Leagans1961, objective means a direction of movements. If objectives are defined as the direction of movement then a goal may be defined as distance in any given direction during a given period of time. Some say objectives, aim, goals, and purposes are SYNONYMS but it is not so. There are different of classification of objectives, they are as following:

**Fig (2-1) classification of objectives of extension**



(Balaraman,2007)

### **2-1-10 Levels of extension objectives:**

**1-**Social objectives (increase production, achieving production efficiency in the agricultural sector in general)

**2-** Collective objectives (improving the level of the family in terms of production, living and effective upbringing of individuals)

**3-**Individual objectives (development of the individual culturally and intellectually through the development of abilities. (N.Balaraman2007)

### **2-1-11 Extension Educational Process:**

Extension education is a process and it is participatory in its approach. According to (Leagans1961) the sequence of steps involved in the process are:

(i) Situation analysis

(ii) Formulation of objectives

(iii) Deciding the content and teaching methods

(iv) Outcome evaluation and impact analysis and

(v) Feedback and formulation of corrective action.

In this way the continuous process of extension education goes on resulting in progress of the farmers from a given situation to a desirable situation.

## **2-2 Extension methods:**

Extension methods are the ways of communicating between the farmers and the extension agents. Through extension methods knowledge and skills are disseminated to the farmers. It is vital for the extension agent to completely be familiar with these methods since it is important for the agent to pick a certain method according to the situation. (Krishiworld n.d.2011) .Stated the following some general definition extension methods:

-Channels of communication are the various methods available to any communicator in reaching an audience with a message (FAO, 1984)

- Communication channel is the means by which a message gets from a source to receiver (Amin, 2004)

-Defined media as any materials, objects, instruments or system which serve to communication information including, farming press, other written and printed materials, all types of cinema films, radio and television and video system. Communication has also been defined as a process by which participants create and share information with another in order to reach mutual understanding. He further defined communication as a process of sending and receiving messages through the channels and devices at a convergence and as established meaning between a source and receiver (Abubakar et al ., 2009)

### **2-2-1 Types of extension methods:**

There are many studies, which classified extension methods to several types including:

-Broadly speaking information flow was promoted by three means: mass media, group media and interpersonal contact (Glendinning et al.,2001)

-According to the standard quantitative and commonly use, extension methods are classified into three types :Individual, group, and mass media (Kenny ,2002)

-Various methods which can be used by extension system include, personal instruction through home visit and farm visit, group methods such as video, workshop, group discussion, demonstration, and field day, mass media such as radio, television and printed publication such as posters, instruction leaflet, calendar and hand bill (Yahaya.2003)

-Mathialagan, (2007), extension methods and classified according to use (individual teaching – group teaching –mass contact), according to form (Written method –Spoken methods– Visual method) and according to function (Telling – Showing - Doing)

### **2-2-1-1 Individual contact methods:**

According to (Salah, 1997) individual contact methods defined an individual communication methods usually to mean any contact occurring between two people (e.g.: an extension worker and a farmer) in a particular education setting.

There are three types of individual extension methods. They are: visits, phone calls and personal letters (Salah, 1997)

#### **1-Visits:**

According to (Salah,1997) the extension visits could be summarized as following:

- **The farm visits:**

Means the visits carried out by the extensionist to the farmer in his farm for direct on the spot advice, discussion, training and feed-back .Its importance lies in the face- to- face exchange of ideas or experiences and mutual respect .

- The home visits:

The visits which are carried out by extensionists (Males or Females) to the farmers home ,youth clubs, cooperative societies centers and village development committees sites .Its importance lies in the fact that it facilitates the involvement of the women farmers and home keepers in the development activities as who are traditionally disadvantaged and unfairly marginalized.

- The office visits :

Include visits of the individual farmers to the extension office to meet the extension and \or the subject matter specialists (SMSs) to discuss any issue related to their farming, to report any problem and to seek advice and inputs. This is very important and should be encouraged because the extension agents in Sudan, generally do not have the means, time and facilities to reach every farmer.

## 2-Office calls:

It is a call made by farmers or a group to the extension worker at his office for obtained information and for inputs or other farm-helps needed or for making acquaintance with him. The volume of office calls is related to the degree of public interest in the programme of the extension worker and the villagers, and the accessibility of his office to rural people (Balaraman,2007).

## 3-Personal letters:

Between extension agent and any individual farmer, the letter could be hard or electronic (by e-mail) to deal with situations and specific issue. This method is very important in agricultural work because some time the farmer needs to write a letter to the extension agent to request information or ask advice to solve some problems he is facing (Saleh. 1997)

### **2-2-1-2 Group contact methods:**

According to (Saleh. 1997) the definition group contact methods means the direct contact between extension worker and a small group of beneficiaries in a particular educational sitting, the most important methods of group communication are the following:

1- Various forms of extension meetings (Special interest group meeting, panel meeting, symposium, lecture, and small group discussion). According to (Kelsey and Hearnec1963)). Also Extension meeting was divided in to five types used in extension work as follows: (Organizational meetings – Planning meetings – Training meetings – Local meetings – Extension meetings)

#### **2-Practical clarification Demonstration:**

Farmers are keen on seeing how a new idea works and how it might affect their crop production. Both of these can be done by a demonstration. An appropriate and practical demonstration is an important method in extension, especially among farmers who cannot read. This is because they have an opportunity to watch the differences between the new idea and the old one. The demonstration should be simple and it should illustrate concrete results to the farmers. In extension work, the agents use two different kinds of demonstrations. These are called method demonstration and result demonstration. Both of these require a great deal of thought, planning and competent implementation. (Food and Agriculture Organization of the United Nations n.d.1984)

3-Field day.

4-Hearing and Viewing clubs.

5-Extension Tours.

6-Rural Theater.

7-Farm field schools.

Group methods are also used for extension, such as meetings, seminars, classes for local farmer and include innovative methods such as plays, films, dance-drama, and visits to nurseries (Glendinning et al .,2001).

### **2-2-1-3 Mass Media Contact Methods:**

Some Definition of mass media:

-Mass media methods involve use of audio visual and printed communication channels to convey information to large numbers of people, it comprise both the broadcasted and printed media , and each has an audience which prefers it. This view is well explained by Oakely according to Elkali (1985)

- A channels through which messages are flowing from a source of one or few people to heterogeneous large audience. They com-pries both the broadcasted and printed media, medium has it is appeal which attracts audience to choose it in preference to another medium (Oakely, and Gaforth1985)

-Is the process by which the sender can send content of message simultaneously to large number of people difference among themselves, in the social, economic, cultural, psychological .political, etc.. And deployed in different geographical areas (Saleh. 1997).

Types of Mass Media:

Many studies described the classification of mass media, as the following:

-Mass media can be classified as print media and electronic media (Farooq et al., 2007).



-Important electronic media pertinent to agriculture include, television, and internet. However, these may also be used as an effective source of agricultural information. Farmers' awareness of this source of agricultural information reflects its worth as an information source (Kana et al., 2010)

According to Saleh (2007) the mass media methods in agricultural extension work include the following media:

1-Agricultural journalism

2-Extension publication (Leaflet, Bulletin, Pamphlet, Circular letters).

3-Extension posters.

4-Radio extension programs.

Radio is a powerful communication tool. Cheap way and so it is available to the majority of agriculture, it can be run with dry battery, small in size and light weight which helps to carry and follow its programs, which are presented in simple form in language that all farmers understand, and in manner that takes into account aspects of local culture in a smooth manner, thus playing a significant role in the transmission of information and change in society. Experience with rural radio has shown the potential for agricultural extension to benefit from both the reach and the relevance that local broadcasting can achieve by using participatory communication approaches. The importance of sharing information locally and opening up wider information. The radio, if used effectively, will enable many farmers to get information at one time, and will also save time and effort and reduce the cost of extending the information.

5-Television extension programs.

6-Agricultural Exhibits.

7-Museums.

8-Electronic Websites in international information Network (Internet).

9-Recordings .

10-Communication:

The most important challenge in communication of livestock technologies is to find out ways and means to convey the messages to the livestock farmers in an effective manner which enable them to take appropriate decisions on adoption of the technologies. To meet this challenge, it is important to understand the communication process, extension teaching methods, audio visual aids and their usage for effective communication. The word communication originated from the Latin word “Communis” which means common. Leagans 1961 defined communication as a process by which two or more people exchange ideas, facts, feelings or impression in such ways that each gains a common understanding of the meaning and use of messages

Through communication, an individual shares his idea, information and knowledge with others. A good communication is the one which conveys the receiver what exactly the communicator wants to convey. A good communication depends upon the communicator's ability to organize the message with proper treatment in suitable channel keeping in view the receiver's type, cognitive ability and experience.

Communication definition:

The definition of the means of mass media communication:

Realistic of fanciful unified message addresses large number of people who differ economically, culturally, politically and geographically such as radio, television and internet .(Singh 2006).

Advantages: of mass communication according to (Hag2000)

- It can reach a large number of people.
- It can repeat explain the issues more than once.
- Low cost.
- Help and support other ways.

Disadvantages: of mass communication according to (Eitanobi1998)

- High expertis and skills required.
- Requires knowledge of the nature of the different communities (there language and dialects).

#### Key Elements of Communication:

There are several models to explain the concept of communication. There are six important elements involved in the communication process. The six key elements are: Communicator, Brief meanings of the key elements are as follows.

1. Communicator: is the person from whom the message originates.
2. Message: is the information or the meaning the communicator wants to convey.
3. Channel: is the media through which the communicator sends/conveys his message.
4. Audience: is the receiver of the message or to whom the message is sent.
5. Feedback: gives the details about audience response to the given communication process.
6. Effect or Impact: is the end result of the communication. It is the change that has taken place with the receiver due to the communication (V.venkatasubramanian,2019)

## **2-3 Challenges facing Livestock Extension:**

1. Millions of people depend on livestock whether directly or indirectly.
2. Livestock owners spread throughout the country.
3. Resource poor livestock farmers contribute a lot to production of milk, meat, egg, wool etc.
4. Common property lands are shrinking leading to increased dependency on purchased inputs.
5. Majority of livestock keepers are poor and women.
6. Veterinarian is the most credible source of information on livestock rearing.
7. The market for livestock and livestock products is mostly unorganized.
8. Per capita consumption of milk among the resource poor milk producers is very low.
9. Majority of the poor own few less productive animals.
10. The livestock owners have no control on quantity and quality of production.

This dynamic livestock situation is posing several challenges to livestock extension services. Some of the challenges with which the extension personnel have to cope up with are;

1. How to reach millions of livestock owners spread in every nook and corner of the country especially those who are thriving in Complex, Diverse and Risk prone (CDR) environment?
2. How to improve the living standards of the rural livestock owners through livestock rearing especially when the pressure on land is increasing and common

property lands are slowly fading out forcing the rural poor to maintain the animals on purchased fodders?

3. How to sustain the production of livestock products with decreasing area under fodder and increase in the competition for feed resources and decreasing interests of the people in livestock rearing?

4. How to face the emerging livestock development situation as a sequel to the technological and development interventions?

5. How to take cognizance of the changes that are taking place in the society which include : Shift from farming to industry; Shift from rural to urban (migration ); Shift from grazing to stall feeding; Shift in focus from social to economic issues. Target Groups:

Livestock development involves a number of target groups with whom the extension agents need to work with. These groups include;

1. Livestock owners: All those who own livestock (dairy farmers, sheep and goat keepers, poultry farmers, etc.)

2. Livestock service providers: Animal Husbandry department personnel, Marketing institutions like Milk Cooperatives, , Training institutions , Non – governmental organizations , Research / Academic institutions – Veterinary Universities/ Colleges, animal science institutes, Bankers, Insurance agencies etc.

3. Input suppliers: Semen banks, feed mixing plants, Pharmaceuticals, vaccine production units, Livestock product processing units, Fodder seed production units, Agro related industries etc.

4. Policy makers: Ministry of Agriculture and Animal Husbandry, Researchers, Farmer organizations etc.. (V.venkatasubramanian,2019)

## **2-4 Brief History of livestock extension in Sudan:**

In Sudan the concept of extension and awareness in the livestock sector was introduced with the introduction of the English colonial through improvement of the breed of horses in 1918 and improved breeds of milk-producing cows in the mid-forties of the last century, and until the establishment of the Department of Veterinary Extension at the Ministry of Animal Resources in 1975.

## **2-5 Livestock extension in River Nile state:**

The administration of extension and technology transfer was established in River Nile State since 80s, and it is constituted of the three following departments:

1. Pastoralists communities development department
2. Field programs and technology transfer department.
3. Information and communication department.

The main objective of the extension administration is to improve the livestock sector, where the detailed objectives were:

- To increasing the production
- Contribution in epidemic diseases control
- Technology transfer
- Improvement of production and processing of animals and fish products
- Providing the producers with up dated knowledge and skills
- Creating linkage between research centers and livestock producers

The tasks of the state extension administration:

1. Designing and implementing awareness and orientation message to improve the producers knowledge and skills
2. Designing and use diversity of extension teaching methods
3. Activating the roles of both producers and pastoralists organizations

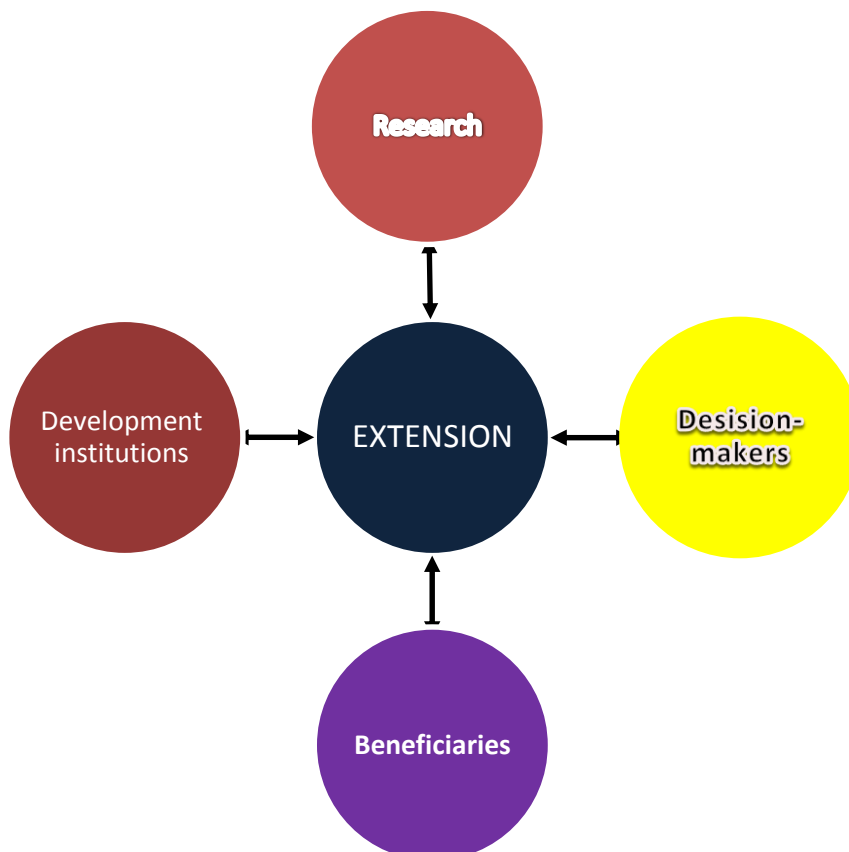
4. Designing a training workshops to targeted the pastoralists community members.

### **2-5-1 Extension methods in the State:**

The extension administration in order to achieve their goals used a diversity of extension teaching methods and means, some of these were:

1. Radio extension programs
2. Field visits
3. Extension campaigns
4. Field days
5. Farmers field schools
6. Extension exhibition
7. Pastoral camps

**Figure (2-2) Shows the relationship of the extension with relevant institutions:**



## **2-6 Adoption of Innovations:**

Innovation and its adoption by the livestock farmers is considered as essential to enhance the production of livestock to meet the demand for the products both internal and external. The technology needs to be brought in at an appropriate time which is ripe for its introduction. Innovation does not mean it should come only from researchers or extension personnel. It can emanate from any source including the farmers. (Venkatasubramanian,2019)

### **2-6-1 Diffusion and Adoption of Agricultural Innovations:**

**Diffusion:** is the process by which an innovation is communicated through certain channels over time among the members of a social system. There are four elements in diffusion process.

**First:** An innovation is an idea, practice or object perceived as new by an individual or other unit of adoption. Technology is a design for instrumental action that reduces the uncertainty in the cause effect relationship involved in achieving a desired outcome. The components of technology are: Hardware and Software .A good innovation should have five perceived attributes of innovations in universal terms following:

1. **Relative Advantage:** It is the degree to which an innovation is perceived as being better than the idea it supersedes. It is positively related to its rate of adoption.
2. **Compatibility:** It is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and the need of potential adopter. The compatibility of an innovation as perceived by members of a social system is positively related to its rate of adoption.



3. Complexity: It is the degree to which an innovation is perceived as relatively difficult to understand and use. The complexity of an innovation as perceived by members of a social system is negatively related to its rate of adoption. For example, change in variety of a particular crop is not that complex as change in total enterprise (e.g. shifting from crop production to poultry production).

4. Trialability: It is the degree to which an innovation may be experimented with on a limited basis. The trialability of an innovation as perceived by social system is positively related to its rate of adoption.

5. Observability: It is the degree to which the results of an innovation are visible to others. The observability of an innovation as perceived by members of a social system is positively related to its rate of adoption.

On the basis of above traits it can be said that technologies which are relatively more advantageous; compatible with social values, past experiences, and the need of potential adopter; simple to understand and use; can be experimented on a small scale; and which results are visible to others are rapidly adopted by the members of a social system. Technologies which are lacking in these traits take more time to be adopted by the members of a social system.

**Second:** Communication Channels It is the means by which the messages get transferred from one individual to another. Mass media are good for creating awareness knowledge where as interpersonal channels are good for forming and changing attitude of the people towards technology:

**Third:** Time it is involved in: Innovativeness, Innovation rate of adoption, Innovation Decision Process.

(1) Innovation–Decision Process

The innovation-decision process is the process through which an individual (or other decision making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.

Rogers (1983) has proposed following five stages of Innovation-Decision Process:

- Knowledge: At this stage an individual (or other decision-making unit) is exposed to the innovations existence and gains some understanding of how it functions.
- Persuasion: At this stage an individual (or other decision-making unit) forms a favorable or unfavorable attitude towards the innovation.
- Decision: At this stage an individual engages himself in activities that lead to a choice to adopt or reject the innovation.
- Implementation: At this stage an individual puts an innovation into use.
- Confirmation: At this stage an individual seeks reinforcement for an innovation-decision already made, but he or she may reverse this decision if exposed to conflicting messages about the innovation.

Rogers indicates that Implementation often implies that the innovation is modified to suit more closely the need of the farmer who adopts it. People often gather additional information after they have adopted an innovation to confirm they have made the right decision.

(2)Innovativeness: It is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system.

(3) Rate of Adoption: It is the relative speed with which an innovation is adopted by members of a social system. Adoption is a decision to make full use of a new idea as the best course of action available.

**Fourth:** Social system: It is a set of interrelated units that are engaged in joint problem solving to accomplish a common goal.

### Components of a Social System

\* Structure: It is patterned arrangement of the units.

\* Norms: These are the established behavior patterns. Opinion leaders exhibit the norms.

- Heterophily: It is the degree to which pairs of individuals who interact are different in certain attributes, such as beliefs, education, social status and the like.
- Homophily: It is the degree to which pairs of individuals who interact are similar in certain attributes such as beliefs, education, social status and the like.

- Adaption: According to JonnaLuukkainen (2012) It is a mental process that starts from the individuals hearing of the new idea for the first time until a decision is made to accept or reject it. Farmers' decisions on what to carry out in their farms are based on existing information. The adoption process is a procedure where farmers choose either to use or not to use new ideas in their farms. These new ideas might be for example new technology or innovations.

### Stages of Adoption:

Rogers (1983) has given following five stages of adoption process:

1. Awareness: At this stage an individual first hears about the innovation. This means that individual is exposed to an idea but lacking detailed information about it. This is somewhat like seeing something without attaching meaning to it.

2. Interest: At this stage an individual is motivated to find out more information about the new idea. An individual wants to know what it is, how it works and what its potential may be.

3. Evaluation: At this stage mental trial of new idea takes place. An individual considers the relative advantage of the new idea over other practices/alternatives.

4. Trial: At this stage an individual tests the innovation on a small scale for himself. An individual seeks information about technique and method of applying the new idea.

5. Adoption: If satisfied with trial an individual will decide to use the innovation on large scale in preference to old methods.

\* Rejection is the decision not to adopt an innovation while Discontinuance is a decision to cease the use of an innovation after adopting it earlier. Discontinuance, then, is essentially adoption of an innovation, followed by rejection. Discontinuance is of two types:

- Replacement: Replacement discontinuance is a decision to reject an idea in order to adopt a better idea that supersedes it.
- Disenchantment: Disenchantment discontinuance is a decision to reject an idea as a result of dissatisfaction with its performance.

## **2-6-2 Factors effecting the deployment of innovations: (Rogers et al 1971)**

- Social factors (Traditions - Habits)
- Economic factors
- Political factors

## **2-6-3 Role of extension in the transfer and adoption of technology:**

That the work of agricultural extension is the basis for the development of the agricultural sector, and without agricultural extension, it does not have any benefit from modern agricultural techniques and modern agricultural information. Agricultural Extension and is responsible for the transfer of agricultural technologies to farmers, and to convince farmers to adopt modern agricultural techniques. The transfer of agricultural technologies be through many stages, that agricultural extension is the bridge that connects farmers with agricultural research centers in order to transfer all agricultural techniques to farmers and teach them how to use them in their farms. Also, the Agricultural Extension works on transportation the problems and needs of farmers to agricultural research centers in order to find solutions to them., that the agricultural extension workers have an effective and important role in helping farmers solve agricultural problems.

## **2-6-4 Strategies to Diffuse Innovations among Resource Poor Farmers:**

### **1. Farming System Research/Extension (FSR/E)**

FSR is an approach to agricultural research and development that views the whole farm as a system and focuses on. The interdependencies between the components under the control of members of the household, and how these components interact with the physical, biological and socioeconomic factors not under the household's control (Shaner et al, 1982). This approach was developed

in the 1970s in response to the observation that groups of small scale farm families were not benefiting from the mainstream agricultural research.

## 2. Farmer-Back-to-Farmer Extension (FBF)

According to Rhodes and Booth (1982) Farmer-back-to farmer extension model is associated with farming system research. Basic philosophy behind this model is that successful agricultural research and development must begin and end with the farmer. Applied agricultural research cannot begin in isolation on an experimental station. Research must strive to close the circle, from proper identification of the problem to farmer's acceptance or rejection. The purpose of diagnosis is to arrive at the widest possible consensus between farmers, social scientists and technologists on the definition of the problem to be solved.

## 3. Farmer- First- and- Last Model (FFL)

According to Chamber and Ghildyal (1984) FFL model is almost similar to the previous model. It starts with holistic and interdisciplinary appraisal of the farm families, resources, needs and problems and continues with on-farm and with farmer R&D while the scientists, experiment stations and laboratories act in a consultancy and referred role. It fits the needs and opportunities of resource poor farmers' better than transfer of technology model. It promises a greater contribution from agricultural research in the eradication of rural poverty in the country.

# CHAPTER THREE

## Methodology of research

### 3-1 Study area:

River Nile State is located between Latitudes 16 – 22 North, and Longitude 32 – 35 South. From the North, it is bordered by the Arab Republic of Egypt from the East Kassala and Red Sea States and on the South Khartoum State and from West the Northern State. The River Nile traverse the lands of the State on its way Northwards where it is joined by Atbarah River. The State area is 122.1000 square Kilometers. It is ranked as the sixth State in terms of area , among the Northern States, where it is headed by Northern State- Northern Darfur- Red Sea- Northern Kordofan- South Darfur with total population of 1,240,440 persons , it includes seven localities (AL-damar - Atbara - Berber – Abu Hamed –Elmatama - Elbuhaira) The state is a region free from epidemic diseases and it is a favorable environment for animal breed , so the state has good local breeds an estimated number of foreign breeds and hybrids of various types of animals (internet).

Table (3 - 1): Showing the numbers of livestock in the River Nile state

Equines	Camel	Goat	Sheep	Cattle
216276	82723	1654450	1369619	106822

( Department of Livestock and Pasture 2016 )

### **3-2 Research population:**

The study population represented by local producers in the livestock sector in three localities of the state (AL-Damar –Atbarah – Berber)).

### **3-3 Sampling:**

The samples of 90 producers were randomly selected from the three localities (Ad-Damir –Atbarah – Berber) 30 respondents from each locality. The survey was conducted in the period 23\7\ - 10\8\2019.

### **3-4 Data Collection:**

The study used primary and secondary sources for data collection.

Primary sources: Primary data were collected by using face – to – face questionnaire by researcher.

Secondary sources: Secondary data were obtained from the references, reports, papers and web side

### **3-5 Data analysis:**

The collected data were analyzed by using computer program SPSS17 (Statistical Package of Social Science) to obtain frequencies, percentage and Chi-square.



# CHAPTER FOUR

## Result and discussion

### 1- Social characteristics:

**Table (4-1) Frequency distribution of respondents according to educational level:**

<b>Educational level</b>	<b>Frequency</b>	<b>Percent</b>
Illiteracy	6	6.7
Primary	21	23.3
Secondary	24	26.7
University level	34	37.8
Post graduate	5	5.6
<b>Total</b>	<b>90</b>	<b>100.0</b>

Source: field survey 2019

Table (4-1) above shows that (37.8% and 5.6%) of respondents Were University graduates & post graduate respectively , while there a minority were illiteracy 6.7%.

**Table (4-2) Frequency distribution of respondents according to Social status:**

<b>Social status</b>	<b>Frequency</b>	<b>Percent</b>
Married	69	76.7
Single	19	21.1
Widowed	1	1.1
Divorced	1	1.1
<b>Total</b>	<b>90</b>	<b>100.0</b>

Source: field survey 2019

Table (4-2) above shows that the majority (76.7%) were married, where as some (21.1%, 1.1% and 1.1%) were single, widowed and divorced respectively.

**Table (4-3) Frequency distribution of respondents according to Family size:**

<b>Family size</b>	<b>Frequency</b>	<b>Percent</b>
Small (less than 5persons)	24	26.7
Medium ((5-10)persons))	47	52.2
Big (above 10pesons)	19	21.1
Total	90	100.0

Source: field survey 2019

Table (4 -3) shows that more than half of respondents (52.2%) have a medium families ranged from (5 to 10) persons while (26.7%) and (21.1%) having small and big families respectively.

**Table (4-4) Frequency distribution of respondents according to age:**

<b>Age</b>	<b>frequency</b>	<b>Percent</b>
(25 – 35) years	24	26.7
(36 – 45) years	41	45.6
(46 – 60) years	20	22.2
Above 61 years	5	5.6
Total	90	100.0

Source: field survey 2019

Table (4 - 4) above shows that the majority of respondents (72.3%) were in the group ranged between (25 to 45 Yrs.), while the minority of respondents (5.6%) were above 61 years old.

**Table (4-5) Frequency distribution of respondents according to type of activity:**

Type of activity	frequency	Percent
Animals breeding	78	86.6
Poultry breeding	12	13.3
Total	90	100.0

Source: field survey 2019

Table (4 – 5) above shows that the majority of respondents (86.6%) Were animal breeders (cattle, sheep, goats) while (13.3%) were poultry breeders.

**Table (4-6) Frequency distribution of respondents according to herds types:**

Herds types	Frequency	Percent
Poultry	12	13.3
Small ruminants	48	53,3
Large ruminants	30	33.3
Total	90	100.0

Source: field survey 2019

Table (4 – 6) above shows that more than half of respondents (53.3%) Were breeder Small ruminants (sheep's and goats), whereas some (33.3% &13.3%)were breed big ruminants and poultry respectively .

**Table (4-7) Frequency distribution of respondents according to their experience y :**

Experiences	Frequency	Percent
Less than 5 years	19	21.1
From (5 - 10) years	39	43.3
More than 10years	32	35.6
Total	90	100.0

Source: field survey 2019

Table (4-7) above shows that (21.%) of respondents were less than 5 year experience, while the majority (43.3%) having experience from (5 – 10) years.

**Table (4-8) Frequency distribution of respondents according to system of breeding and production:**

<b>System of breeding and production</b>	<b>frequency</b>	<b>Percent</b>
Traditional	83	92.2
Semi modern	7	7.8
Total	90	100.0

Source: field survey 2019

Table (4 -8 ) above shows that the majority of respondents (92.2%) were practices a traditional breeding system (raising animals in the municipal barns and provide water, food and milking manually), while (7.8%) were raising animals in Semi modern system this system were practices in poultry farming where water and food are provided automatically.

**Table (4-9) Frequency distribution of respondents according to profitability gained from breeding and production:**

<b>Income gained</b>	<b>Frequency</b>	<b>Percent</b>
Profitable	54	60.0
Very Profitable	30	33.3
Non-Profitable	6	6.7
Total	90	100.0

Source: field survey 2019

Table (4 - 9) above shows that the majority of respondents (60%) says that they gain Profit income from breeding and production, while (6.7%) non-profit because of the high prices of inputs in the livestock production.

**Table (4-10) Frequency distribution of respondents according to herd size:**

<b>Size of herd</b>	<b>Frequency</b>	<b>Percent</b>
Less than 50	46	59
From (50 – 150)	21	26.9
More than 150	11	14.1
Total	78	100.0

Source: field survey 2019

Table (4 - 10) above shows that the majority of respondents (59%) Were own Less than 50 heads of animals while (26.9%) having from (50 – 150) heads and (14.1%) of respondents were own more than 150 heads.

**Table (4-11) Frequency distribution of respondents according to flock size of birds:**

<b>Size flock of birds</b>	<b>Frequency</b>	<b>Percent</b>
Less than 2000	3	25
From (2000 – 4000)	4	33.3
More than 4000	5	41.7
Total	12	100.0

Source: field survey 2019

Table (4-11) above shows that majority of respondents (41.7%) they had a flock of birds more than 4000birds, while (33.3%) and (25%) were from (2000 – 4000) birds & more than 4000birds respectively.

## 2-Source of extension information:

**Table (4-12) Frequency distribution of respondents according to their degree of reliability on various extension means and methods:**

Extension methods and	Degree of reliability					
	Not depended		To some extent		Depended	
	Frequenc	%	Frequenc	%	Frequenc	%
Office visits	29	32.2	17	18.9	44	48.9
leaflet	21	23.3	30	33.3	39	43.3
Radio	16	17.8	37	41.1	37	41.1
Filed days	37	41.1	30	33.3	23	25.6
Posters	30	3.33	48	53.3	12	13.3
TV	67	74.4	15	16.7	8	8.9
Lectures	45	50.0	38	42.2	7	7.8
Extension meetings	59	65.6	26	28.9	5	5.6
The fairs	35	38.9	51	56.7	4	4.4
newspapers	77	85.6	10	1.11	3	3.3
Home visits	79	87.8	9	10.0	2	2.2

Source: field survey 2019

Table (4-12) Indicates that (48.9%) of respondents were totally depended on office visits to gain their required agricultural information while (43.3%) were depended on leaflet, and (41.1%) were dependent on livestock extension radio programs. Whereas the minority of respondents (4.4%, 3.3% and 2.2%) were dependent on fairs, newspapers and home visits respectively.

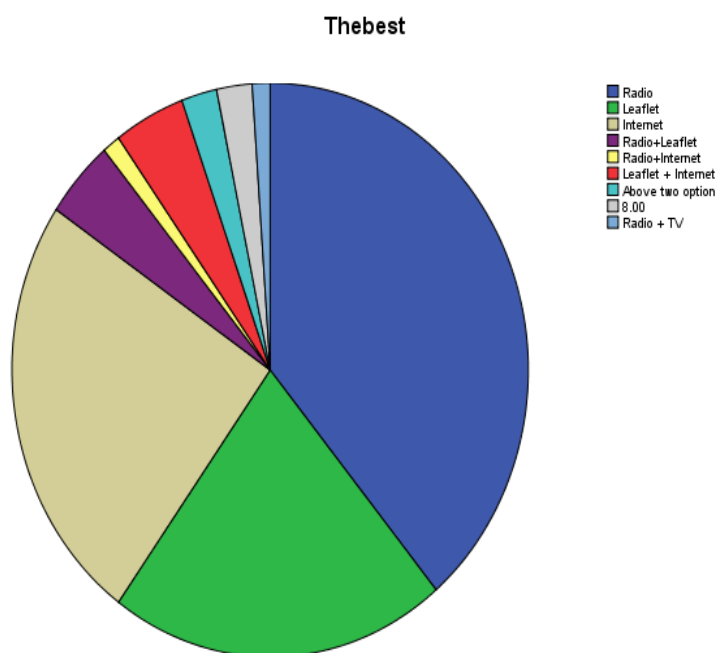
**Table (4-13) Frequency distribution of respondents according to their follow-up to the livestock extension radio program:**

<b>Follow-up</b>	<b>Frequency</b>	<b>Percent</b>
Always	33	36.7
Sometimes	45	50.0
Never	12	13.3
Total	90	100.0

Source: field survey 2019

Table (4- 13) shows that the majority of respondents (86.7%) were attended the extension radio programs, while a minority (13.3%) were never attendant these programs.

**Figure( 4 -1) Showing The best extension methods for respondents:**



Shape (4-1) above shows The preferred extension methods of the respondents and shows the role of the internet in providing livestock information and also appear that there a number of respondents using more than two methods to obtain information.

**Table (4-14) Frequency distribution of the respondents according to follow-up for both morning capsules & veterinary journal extension radio program:**

Livestock extension radio programs	The degree of follow-up					
	Never		Some times		Always	
	F	%	F	%	F	%
morning capsules	40	44.4	27	30	23	25.6
veterinary journal	40	44.4	30	33.3	20	22.2

Source: field survey 2019

Table (4 - 14) shows that the follow-up rate for morning capsules radio program were (55.6%), this program is presented in form of a capsule or prescription to conduct light extension information regarding animal health and husbandry in short period of time (not more than 5 to 6 minutes) 5times a week from Sunday to Thursday, broadcast within the program (Sabah Alkhair River Nile). Regarding the veterinary journal radio program the table revealed that more than half of respondents (55.5%) were attendant to this program, it is weekly program broadcast live on Wednesday of each week once at 5pm (30-40) minutes and receives calls from producers and breeders.

**Table (4-15) Frequency distribution of respondents represent their opinion about the suitability of time for broadcasting the morning capsules and veterinary journal program:**

Livestock extension radio programs	The suitability of time			
	Suitable		Not suitable	
	F	%	F	%
morning capsules	20	40	30	60
veterinary journal	17	34	33	66

Source: field survey 2019

Table (4 - 15) Shows that (40% and 34%) of respondents were reported that the broadcasting time is suitable for morning capsules and veterinary journal respectively.



**Table (4-16) Frequency distribution of respondents according to adequacy of programs time:**

Livestock extension radio programs	Adequacy of programs time			
	Enough		Not enough	
	F	%	F	%
morning capsules	15	30	35	70
veterinary journal	15	30	35	70

Source: field survey 2019

Table (4 - 16) shows that (30%) of respondents were reported that the duration of two programs was enough, while (70%) of respondents were reported that the time duration of two programs was not enough.

**Table (4-17) Frequency distribution of respondents according to covering their areas of interest:**

Livestock extension radio programs	Covered their areas of interest					
	Dose not cover		To some extent		Full coverage	
	F	%	F	%	F	%
morning capsules	24	48	18	36	8	16
veterinary journal	24	48	16	32	10	20

Source: field survey 2019

Table(4- 17) shows that (48%) respondents said that both programs did not cover their areas of interested while(52%)were coverage their interested also equally in two programs.

**Table (4-18) Frequency distribution of respondents according to their opinion about the contribution of radio programs in knowledge level:**

Livestock extension radio programs	Contribute to increasing knowledge					
	no		Moderately affects		Greatly effects	
	F	%	F	%	F	%
morning capsules	19	38	16	32	15	30
veterinary journal	22	44	10	20	18	36

Source: field survey 2019

Table (4 - 18) above shows that (62% and 56%) of respondents reported that morning capsules and veterinary journal contributed in knowledge increasing respectively.

**Table (4-19) Frequency distribution of respondents according to their opinions about the contribution of radio programs to increasing their production:**

Livestock extension radio programs	Contribute to increasing their production					
	No		Moderately affects		Greatly effects	
	F	%	F	%	F	%
morning capsules	23	46	14	28	13	26
veterinary journal	24	48	14	28	12	24

Source: field survey 2019

Table (4 - 19) above showing that (54%) and (52%) of respondents reported the morning capsules and veterinary programs contributed in production increasing respectively.

**Table (4-20) Frequency distribution of respondents according to degree of benefit from livestock radio programs:**

Livestock extension radio programs	Degree of benefit					
	No		Moderately affects		Greatly effects	
	Fe	%	Fe	%	Fe	%
morning capsules	23	46	14	28	13	26
veterinary journal	24	48	14	28	12	24

Source: field survey 2019

Table (4 - 20) above showing that (54%) and (52%) benefited from what was presented for two programs respectively while(46%) and (48%)were no benefit from what is presented in the both programs respectively.

**Table (4-21) Frequency distribution of respondents according to manner of listening to the livestock extension radio programs:**

Livestock extension radio programs	Listening methods					
	individually		Collectively with family		Collectively with friends	
	Fe	%	Fe	%	Fe	%
morning capsules	19	38	27	54	4	8
veterinary journal	17	34	25	50	8	16

Source: field survey 2019

Table (4-21) above shows that (54% and 50%) of respondents listened collectively with their family members to the morning capsules and veterinary journal program respectively.

**Table (4-22) Frequency distribution of respondents according to which is the best direct or live programs:**

Which is the best	Frequency	Percent
Registered(recorded) programs	5	10
Direct(live) programs	21	42
Both together (live and recorded)	24	48
Total	50	100

Source: field survey 2019

Table (4-22) above showing that (48%) of respondents said that both together (Registered and direct) programs were the best while (10%) respondents that recorded programs were the best and (42%) said that the live programs were the best.

**Table (4-23) Chi-square test for the relation between the follow-up for morning capsules extension radio program and some of the respondents' socio-economic characteristics:**

socio-economic characteristics	follow-up for morning capsules				Sig
		Never	Some times	Always	
Educational level	Illiteracy	3	2	1	.914
	Primary	10	7	4	
	Secondary	9	10	5	
	University level	16	7	11	
	Post graduate	2	1	2	
Age	(25 – 35) years	14	5	5	.520
	(36 – 45) years	16	14	11	
	(46 – 60) years	9	5	6	
	Above 61 years	1	3	1	
Type of activity	Animals breeding	32	26	20	.918
	Poultry breeding	6	4	2	
Herds types	Poultry	7	1	4	.648
	Small ruminants	14	14	10	
	Big ruminants	19	12	9	
Experiences	Less than 5 years	11	5	3	.477
	From (5 - 10) years	18	9	12	
	More than 10years	11	13	8	
Size of herd	Less than 50	16	19	11	.122
	From (50 – 150)	9	5	7	
	More than 150	4	2	5	

Table (4-23) shows that there was no significant relationship ( $\alpha = 0.05$ ) between the all studied socio-economics variables and the rate of follow-up for morning capsules program

**Table (4-24) Chi-square test for the relation between the follow-up for veterinary journal radio program and some of the respondents' socio-economic characteristics:**

socio-economic characteristics	follow-up for veterinary journal program				Significant
		Never	Some times	Always	
Educational level	Illiteracy	4	1	1	.672
	Primary	9	9	3	
	Secondary	12	9	3	
	University level	13	10	11	
	Post graduate	2	1	2	
Age	(25 – 35) years	13	7	4	.948
	(36 – 45) years	17	13	11	
	(46 – 60) years	8	8	4	
	Above 61 years	2	2	1	
Type of activity	Animals breeding	34	27	17	.832
	Poultry breeding	5	3	4	
Herd types	Poultry	6	2	4	.773
	Small ruminants	17	19	11	
	Big ruminants	19	14	7	
Experiences	Less than 5 years	11	5	3	.351
	From (5 - 10) years	19	10	10	
	More than 10years	10	15	7	
Size of herd	Less than 50	18	20	8	.047
	From (50 – 150)	18	8	11	
	More than 150	6	2	3	

Table (4-24) shows that there was no significant relationship ( $\alpha = 0.05$ ) between the some studied socio-economics variables (Educational level, age, Type of activity, Herd types and experience) and the rate of follow-up for veterinary journal program. While there was significant relationship between herd size and follow-up for veterinary journal program.

## **4-2 Summary of the result:**

The main result of the study are the following:-

- 93.3% of the respondents were educated.
- 68.6% of the respondents were breeders small animal (cattle – sheep-goats)
- 92.2% of the respondents were practices a traditional breeding system (raising animals in the municipal barns and provide water, food and milking manually).
- 48.9% of respondents were totally depended on office visits to gain their required agricultural information.
- 43.3% of respondents were depended on leaflet.
- 41.1% of respondents were depended on livestock extension radio programs.
- The majority of respondents (86.7%) Were attended the extension radio programs.
- 48% of respondents were best both together (Registered and direct) programs.
- 42% of respondents were preferred live programs because they provide an opportunity for discussion.
- (54% and 50%) of respondents listened collectively with their family members to the morning capsules and veterinary journal program respectively.
- 62% of respondents reported that morning capsules contributed in knowledge increasing.
- 56% of respondents reported that veterinary journal contributed in knowledge increasing.

## **CHAPTER FIVE**

### **Conclusion and recommendations**

#### **5-1 Conclusion:**

Radio is considered as an effective tool to disseminate various forms of information and it is the most powerful mass media for broadcasting information quickly. Among the various means of information access and dissemination, radio is very significant due to its portability and comes in different sizes. Radio has been from a time immemorial and today is still very important in accessing information; advancement in information and communication technology has greatly improved access to information. More needs to be done to improve access of reach producers in their areas via the internet, though some people have access to the internet through the use of modem phones, government needs to formulate policies that will further enhance access so that people can enjoy the benefits provided by this super information highway, and should be reviewed to enable more residents to have access to the leading television stations in the world with latest information that helps animal owners learn about the modern technology in the livestock field.



## **5-2Recommendations:**

- 1- Choose radio programs time according to the appropriate time for the producers so that programs receive more follow-up.
- 2- Motivating and encouraging respondents for follow-up of radio programs.
- 3- Re-broadcast radio programs at different times, to allow a large number of producers to benefit.
- 4- Make studies to assessment the extension methods used in the River Nile state to learn the reality of the state's extension to develop the extension work.
- 5- Activate the extension role and linking the extensionists with the producers, thus facilitating the transfer of technology to develop the livestock sector.
- 6- Necessity focus on the use of leaflets and visits as the producers favorite extension methods in the state.
- 7- Training and qualification of the extension worker cadres to improve performance.
- 8- Provide extension information in the form of a question and answer.

## REFERANCES

- **Abu Bakar, A.K. Ango, U Buhari** (2009) the rules of mass media in disseminating agriculture information to farmers in BirninKebbi local government area of Kabbi state : A case study of state Fadama II development project, journal of agriculture extension, 13(2).
- **Addison R. Maunder**, (1972) Food and Agriculture Organization of the United Nation ,AgricultureExtension Reference Manual, Author-Editor ,Roma
- Aker, J. C.** (2010). “Dial ‘A’ for Agriculuture: Using Information and Communication Technologies for Agricultural Extension in Developing Countries.” Tuft University, Economics Department and Fletcher School, Medford MA02155.
- Amin, T.M.**(2004) evaluation of um Jawasir integrated rural development project as a model for settlement of nomads in Sudan, M.Sc. Thesis ,university of Khartoum, faculty of agriculture
- Anandajayasekeram P.,R. Puskur, WorknehSindu, and D.Hoekstra.** 2008. “*Conceptsand practices in agricultural extension in developing countries: A source book.*” IFPRI (International Food Policy Research Institute), Washington, DC, USA, and ILRI (International Livestock Research Institute), Nairobi, Kenya. 275 pp.
- Anderson, J. R., and G. Feder.**( 2004). “Agricultural extension: Good intentions and hard realities.” *The World Bank Research Observer* 19 (1): 41–60.
- Annie W and Merle F** (2012). Background Paper: Research and Development and Extension Services. International Development Research Centre, Canada. In

[http://blogs.ubc.ca/foodsecuritypolicyinasia/files/2012/02/Draft-Paper\\_Wesley-Faminow.pdf](http://blogs.ubc.ca/foodsecuritypolicyinasia/files/2012/02/Draft-Paper_Wesley-Faminow.pdf)

-**BELLO, A.**,( 2008 )Introduction to agricultural extension and rural sociology: National open university of Nigeria, Nigeria

- **Chambers,R. and Ghildyal, B.P.**1984. Agricultural Research for Resource-Poor Farmers: The Farmers-First-and-Last Model. Paper Presented in the Workshop on NARP at NAARM, Hyderabad (Cited by T. Balaguru,1986).

- **Dr.N.Balaraman.**,(2007),textbook of animal husbandry extension (third revised &enlarged edition Chennai

-**Dr. Jitendra Chauhan** (2000). Agriculture Extension Education , Introduction to Agricultural Extension Education. Reader, Agriculture Extension R. B. S. College, Bichpuri, Agra-282007 (30-11- 2000)

-**Eitanobi, O .M** (1998) The reference of information, and agricultural, darelmareef , Egypt

-**Ensminger, D.** (1957), A Guide to Community Development Ministry of Community Development and Cooperation, Government of India. -

**FAO**(1984)Agricultural extension ,a reference manual ,second edition

-**FAO** (1972)Agricultural extension ,a reference manual , Roma ,

Addison R. Maunder, Author Editor EXTENSIONA Reference Manual

-**Farooq –Sher Mohamed –Khalid M Chauhdary –Ijaz Ashraf** ,( 2007) role of print media in the dissemination of agricultural information among farmers, pak . J.Agyi. Sci., 44(2)

-**Ferroni , M. &Zhou, Y.**(2012)Global Journal of Emerging Market Economies, 4:319

- Glendenning**, C.J.et al,(2010) Review of Agricultural Extension In India Are Farmers Information Needs Biing Met?, International Food Policy Research Institute (IFPRI) , the Discussion Pepper series .
- Glendenning**, Anthony et al,(2001) Modes of Communication and Effectiveness of Agro forestry Extension in Eastern India, Human Ecology, 29(3)
- **Hag ,E.K**(2000)the role of mass media inactivity process of adoption and modernization amongst the farmers province east of Nile-khartoum state (MSc).factually of agriculture – university of Sudan science and technology .
- JonnaLuukkainen** (2012)Degree programme in Sustainable Development Agricultural Extension Service Providers in Nyandarua County, Kenya.
- Dr. Jitendra Chauhan** (2000). Introduction to Agricultural Extension Education ,Reader, Agriculture Extension R. B. S. College, Bichpuri, Agra- (30-11- 2000)
- Kelesy,I,K,and.Hearnec**,.1963.Comstock Publishing Associate , Ithaca. New York .
- Kenny**, C. (2002) Information and Communication Technology for Direct Poverty Alleviation: Costs and Benefits Blackwell Publishers, Development Policy review, 20(2): 141-157.
- -**Krishiworld. n.d.** Accessed 8.9.2011.  
[http://www.krishiworld.com/html/agri\\_extension\\_edu2.html](http://www.krishiworld.com/html/agri_extension_edu2.html)
- **Kana, Muhammad sher, KM Chaudhry, MA Kana** (2010) Present Status and Future Preference of Electronic Media as Agricultural Information sources by the farmers , Pak. J.Aгри. Sci., 47(2), 166-172.

- Leagans, J.P.** (1961), India"s Experience with Training in Extension Education for Community Development, Cornell University of Illinois, U.S.A.
- Mathialagan P .** (2007) Animal Husbandry and Livestock Extension , third Revised, international Book Distributing co.
- Oakely,B,andGaforth ,C.**(1985) Guid to extension training. Agricultural extension and rural development centers, school of education ,university of reading U.K
- Oakley, P. &Garforth, C.**( 1985). Guide to Extension Training. Food and Agriculture Organization of the United Nations. Rome: FAO
- P. OAKLEY AND C. GARFORTH** Rome, (1985)Agriculture Extension and Rural Development Centre, School of Education , University of Reading, UK
- **Rhodes. R.E. and Booth, R.H.** 1982. Farmer-Back-to-Farmer: A model for generating acceptable Agricultural Technology. Agricultural Administration, 11:127-137 (Cited by T. Balaguru,1986).
- **Rogers, E.M.** 1983. *Diffusion of Innovations*. The Free Press, New York.
- **Rogers, M.** Everett J Shoemaker. F.Floyd.1971, communication of innovations .Second Edition, The free , publishing Co.INC.-
- **Saleh. S. M.**(1997)Agricultural Extension : Methods and Educational Aids , (first edition) University of Omar Al-Mukhtar .
- **Singh, A.K**(2006):Agricultural extension: Impact &assessment
- **Shaner, W.W.; Philipp, P.F. and Schmehl, W.R.**1982. Farming Systems Research and Development: Guideline for Developing Countries. Westview Press, Boulder, Colorado, USA

-**Swanson, B. & Rajalahti, R**( 2010). Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems. 5.9.2011 Accessed.

[http://siteresources.worldbank.org/INTARD/Resources/Stren\\_combined\\_web.Pdf](http://siteresources.worldbank.org/INTARD/Resources/Stren_combined_web.Pdf)

-**Venkatasubramanian, V.**(2019), Booklet of livestock Extension Education, www.Icarzcu3.gov, in, book publication , available at 13/6/2019

-**Yahaya, M.K.** (2003) Development Communication: Lessons from Change and Social Engineering Project. Corporate Graphic Publishers, Ibadan 240p. ISBN978-36756-2-1 (100%)

- **Socio-economic and opportunity** mapping Assessment report for River Nile and Northern States at 2019 [www.Undp.org/content/dam/Sudan/docs/...available](http://www.Undp.org/content/dam/Sudan/docs/...available)

-**Annual report** (2016 and 2019) department of livestock and pasture in River Nile State .

(personal Interview

- **Dr. Nasir Mohammed Osman**(2019) **director** administration of Extension and technology transfer in River Nile State)