Analytical Review of Veterinary Extension Delivery Services in Khartoum State, Sudan

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Dedication

To my parents,,

To my husband and family,,,,,,

To my sister,,,,,,,,,,

To my brothers,,,,,,,,,,,,,,,,,,

To my friends,,,,,,,,,,,,,,,,

For their support, patience and understanding I dedicate this work
ACKNOWLEDGEMENTS

First and for most, I would like to thank The Almighty Allah for giving me strength, health, assistance and blessing to achieve this work.

I also thank the University of Khartoum, Department of Preventive Medicine and Public Health for choosing me to (MTAH) master programme.

My great thanks and sincere gratitude are due to my Supervisor Dr. Khitma Hassan Elmalik for her supervision, advice, priceless guidance, patience, help and encouragement throughout the work.

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My special thanks to dear friends for their great help with my best wishes and hopes for better life.

To all mentioned above and those who unintentionally missed, I do pray to Allah The Al mighty to bless them all for the rest of life.
ABSTRACT

This study was planned to analyse and assess the technical backup facilities and to analyse data of adequacy of veterinary extension services to animal owners. Khartoum State was selected purposely due to the presence of Federal Ministry of Animal Resources, Fisheries and Rangeland (FMAFR) and State Ministry of Agriculture, Animal Wealth and Irrigation (SMAAI) that are supposed to provide extension services to the farmers. Primary data were collected through interviews and questionnaires while secondary data were collected from annual reports of FMAFR and SMAAI during the years from 2011 to 2015. Five directors, 25 extensionists and 15 technical workers were interviewed in the Directorates of Extension. About 135 animal owners also filled questionnaires. The data were analysed using SPSS program. The results showed that the respondents of 135 animal owners were composed of 28% illiterate; with the highest (14.8%) illiteracy in Khartoum North. A high proportion (72%) had a degree of education. Those who received veterinary extension services were 50.4% of the respondents. The respondents who keep their animals in farms comprised 67.4% and in household (backyard) 20%. The extension messages in the annual reports of FMAFR and SMAAI poorly addressed zoonosis. Approximately, half (49.6%) of the respondents did not receive any extension services. A considerable proportion (42.7%) of those who had services received extension from sources other than extensionists. In addition, 35.3% of the respondents didn’t see the extensionists in their location. The 180 respondents assessed the elements of communication process (source, message, channel, and receiver), the
technical equipment, the administration budget, evaluation of the administration staff and the constraints of the extension work. Forty percent of the extensionists reported that the main constraints facing the extension work were low and irregular budget from Ministry of Finance while 16% reported the lack of extension role in ministry projects and 12% reported that weak coordination between ministries and targeted communities. The assessment revealed that the administration efforts to deliver extension messages were not enough due to inadequate number of human resources according to 56% of the respondents. No extension records are available before the year 2011 in the two ministries. Moreover, even after this year follow up, Monitoring and Evaluation system and measuring the effect and impact of the extension messages in the annual reports of the two ministries were not found. It was concluded that the role of veterinary extension services is lacking in the field. It is evident that coordination among FMAFR and SMAAI and the targeted communities was not adequate. It is recommended that further detailed studies be carried out to determine the needs to improve the veterinary extension delivery services in Khartoum State and in other states. The extension services are, also, to be revitalized to cope with the requirements of livestock production and productivity improvement.
المستخلص

هدفت الدراسة لتحليل وتقييم المعينات التقنية المتوفرة لخدمات الإرشاد، حيث تم تحليل البيانات لمعرفة مدى كفاءة الخدمات الإرشادية المقدمة ل أصحاب الحيوانات. تم اختيار ولاية الخرطوم لوجود كل من وزارة الثروة الحيوانية والسمكية والمراعي الإقليمية، ووزارة الزراعة والثروة الحيوانية والري بولاية الخرطوم التي من المفترض تقدم خدمات الإرشاد البيطري. تم جمع البيانات الأولى من خلال المقابلات والاستبيانات بينما تم جمع البيانات الثانوية من التقارير السنوية لوزارتين من عام 2011 إلى عام 2015. تمّت مقابلة 5 مدراء، 25 من المرشدتين و15 من التربويين في إدارات الإرشاد. كما تمّ استخدام برنامج SPSS. أظهرت الدراسة أن 28% من أصحاب الحيوانات أميون (أعلى نسبة 14.8% في الخرطوم) و72% على درجة من التعليم. وتلقي 50.4% من أصحاب الحيوانات خدمات الإرشاد البيطري. كما تمّ أن 67.4% من أصحاب الحيوانات يحفاظون حيواناتهم في حظائر و20% في المنازل، ولكن الرسالة الإرشادية في تقارير الوزارتين ضعيفة في تغطية الأمراض المشتركة، نسبة (49.6%) من أصحاب الحيوانات لا يتلقون خدمات إرشادية، و42.7% منهم يثقونها من مصدر آخر غير المرشد و35.3% لم يروا المرشدتين في مواقعهم. قيم 180 من الذين شملهم الاستطلاع كل عناصر عملية الإنصال (المصدر، الرسائل، القناة والمجتمع المستهدف)، المعدات التقنية، ميزانية الإدارة، موظفي الإدارة ومعوقات العمل الإرشادي. أوضح 40% من المرشدتين أن المعلومات الرئيسية التي تواجه العمل الإرشادي هي قلة وعدم إنتاجية الميزانيات، وأفاد 16% عدم وجود دور الإرشاد في جميع المشاريع وأفاد 12% ضعف التنسيق بين الوزارات والمجتمعات المستهدفة. أظهرت النتائج أن المجهودات المبذولة غير كافية بسبب قلة الكوادر وفقاً لما أورده 56% من المستهدفين. لا يوجد تقارير عن الارشاد قبل عام 2011. كما لا يوجد نظام للمتابعة والرصد وقياس تأثير الرسال الإرشادية في التقارير السنوية لوزارتين. خلصت الدراسة إلى أن دور خدمات الإرشاد البيطري ضعيف في الحقل. وأن التنسيق بين الوزارات الإقليمية والوطنية والمجتمعات المستهدفة غني. هذا يوصى بعمل دراسات مفصلة لتحقيق الاحتياجات التنمية خدمات الإرشاد البيطري في ولاية الخرطوم والولايات الأخرى وتشييد نظام توصيل خدمات الإرشاد لكي يتماشى مع متطلبات تحسين الإنتاج والانتاجية للثروة الحيوانية.
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<tr>
<td>AAEV</td>
<td>American Association of Extension Veterinarians</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation</td>
</tr>
<tr>
<td>FMAFR</td>
<td>Federal Ministry of Animal Resources, Fisheries and Rangeland</td>
</tr>
<tr>
<td>MARF</td>
<td>Ministry of Animal resource and fisheries</td>
</tr>
<tr>
<td>OIE</td>
<td>Office International de Epizootic (World Organisation for Animal Health)</td>
</tr>
<tr>
<td>SELN</td>
<td>State Extension Leaders Network</td>
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<tr>
<td>SMAAI</td>
<td>State Ministry of Agriculture, Animal Wealth and Irrigation</td>
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INTRODUCTION

Activities practiced by animal owners in rearing and production are means of livelihood in the Sudan practiced by about 80% of the population. The majority of livestock is in the hands of pastoralist. Animal production is therefore, practiced under traditional production and harsh environmental conditions in rural areas where veterinary services are limited. This makes it necessary to reach this sector with adequate extension services (Elnaeim et al. 2015).

Veterinary extension activities represent an important tool to assist the Veterinary Services in controlling animal diseases and improving animal health and veterinary public health (including food safety) and animal welfare; Veterinary extension can have positive effects on the livelihood of animal holders, by helping them to improve the health status of their animals and reduce losses caused by animal diseases (OIE 2011).

The OIE’s definition of Veterinary Services as a broad entity comprising not only the Veterinary Authority, but all governmental and non-governmental players involved in the implementation of animal health and welfare standards and guidelines. It is highly important for the Veterinary Authority —i.e. the “official veterinary services”— to be aware of and involved in all extension-related activities in their field of expertise. The involvement of the Veterinary Authority in extension activities related to their mandate should consequently be considered as a means of supporting the implementation of public and private components of Veterinary Service
policies and thus helping countries to comply with international standards. (Khoury, 2011)

Veterinary operational guidelines act as a link between the producer and the research centers through the application of scientific research by the beneficiary sectors. It also provides a feedback to develop and orient scientific research to resolve priority field problems. The veterinary extension plays an effective role in this respect through the establishment of instruction offices at the states and the training of workers as well as creating a mechanism for linking research with the instruction through the provision of specialists and information materials, there are required to strengthen extension services (Anon, 2015).

Pratt et al. (1997) stated that in Elbaja area, absence of veterinary services may be due to lack of interest in pastoral sector by officials, in addition to the shortage in budgets of range administration to provide services in-spite of the considerable economical return of livestock. Moreover, they did not receive any kind of extension services to raise their awareness and perceptions towards participation in different natural range lands activities. The absence of range administrations role in providing pastoral communities with necessary services such as seed casting, opening of fire lines, distribution of water points, in addition to extension and veterinary services.

Gammareldain et al. (2015) reported that in the White Nile State, the spreading of the diseases may be due to lack of veterinary care and extension services that should be provided to the pastoralists by officials, especially in rainy
season when infections by various animal diseases increase, in addition to the weak awareness among pastorals about symptoms of some animals diseases.

Elnaeim et al. (2015) remarked that no extension programmes for awareness raising of stock owners and capacity building for public and private veterinarians with regard to veterinary waste management were identified neither at the federal nor the state levels. Training programmes are needed for public and private veterinarians for capacity building and for stock owners for awareness raising.

This study was designed to evaluate the capacity of veterinary extension services to deliver adequate extension to the target communities.

Thus the objectives of the study are:

General overall objective is to analyse the present situation of veterinary extension services in Khartoum State, Sudan, and to suggest possible improvement in the extension organization, as personnel and facilities.

Specific objectives are:

1- To monitor the qualification of personnel in veterinary extension service.
2- To assess the technical back-up facilities for extension service.
3- To analyse data of adequacy of extension services provided to different animal owners groups.
CHAPTER ONE

LITERATURE REVIEW

1-1 Definition of Extension

During the four ties of the last century extension was defined as "central task of extension is to help rural families help themselves by applying science, whether physical or social, to the daily routines of farming, homemaking, and family and community living". (Brunner and HsinPao Yang, 1949)

Maunder (1973) defined it as service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting social and educational standards.

Towards the end of the century the definition was elaborated to be a professional communication intervention deployed by an institution to induce change in voluntary behaviors with a presumed public or collective utility, and organized exchange of information and the purposive transfer of skills. Roling. (1988) and Nagel (1997)

The most resent definition mentioned by SELN (2006) was that, Extension is the process of enabling change in individuals, communities and industries involved in the primary industry sector and in natural resource management.
1-1-1 The Concept of Extension

The word extension is derived from the Latin roots "ex" meaning "out" and "tensio" meaning "stretching". Extension education is stretching out to the people who are beyond the limits of educational institutions.

The basic concept of Extension is 'Education', which is defined as the production of desirable changes in human behaviour i.e. bringing about of desired changes in knowledge (things known), skills (things done) and attitudes (things felt) either in all or one or more of them (Sharma, 2008).

1-1-2 Definition of Veterinary and Animal Husbandry Extension:

It is defined as an applied techno-social discipline developed for the improvement of production and health aspects of livestock through educational means. The agricultural extension and veterinary extension may be the same with respect to philosophy, principles, approaches and contents but they differ with regard to strategies, objectives, methods, subject matter specialists, clients, applications, situations and services (Sharma, 2008).

1-2 Veterinary Extension and Education

The concept of education and teaching is very important in extension process.

1-2-1 Extension Education:
It is a science which deals with the creation, transmission and application of knowledge designed to bring about planned changes in the behaviour of the people with a view to help them to live better by learning the ways that improve their farm, home and community situation (Sharma, 2008).

Veterinary education is one kind of extension education. The main purpose of this education is to help the national economy by saving animal life and increasing production of the animals. This education can help poverty alleviation by different kinds of farming such as poultry farming, beef fattening farming, goat and sheep farming, integrated livestock farming, as well as pigeon, duck, quail, geese, reptile farming. The main work of a veterinarian is to show the right way to the people for poverty alleviation. There is ample opportunity for different kinds of farming. As so many opportunities there is so many constraint, Veterinary Extension education can play a role to remove the nonfinancial constraint.

**1-2-2 Goals/Objectives of veterinary extension education:**

The broader function of extension work is to help people to solve their own problems through the application of scientific knowledge is now generally accepted. Extension is largely educational in nature and approach. Hence, the words “extension” and “extension education” are used interchangeably. Education is a process of bringing desirable changes into the behavior of human beings. These changes must be desirable to the society at large. Leagans, (1960).

The main purpose of this education is to establish different kinds of farm for
• Socio-economic development of rural people.

• Alleviate the poverty of rural area.

• Create self employment opportunities of rural people.

• For income source of rural people.

Faruk (2014) concluded that, Veterinary extension education is an applied science education, now a day it is very much needed for Poverty alleviation. When talking about poverty alleviation then veterinary sector comes in to the line light automatically.

1-3 Role of extension

Extension, in general terms, is a function that can be applied to various areas of society. It operates in the industrial, health and education sectors, as well as agricultural and rural development. Originally derived from «university extension» (Mosher, 1976) the term «extension» is therefore applicable to various areas of development. Several extension roles can be conceptualized to help rural communities get organized, but we will focus on four important roles:

1-3-1 Empowerment Role:

The empowerment role can be a cornerstone of the new approach to extension. Extension personnel need to develop a new philosophy where their role is to help farmers and rural communities organize themselves and take charge (empowerment) of their growth and development. (Chamala, 1990).
1-3-2 Community-Organizing Role

Village extension workers must learn the principles of community-organizing and group management skills (Chamala and Mortiss, 1990) in order to help the community, especially the poor or weaker sections, to organize itself for development. Understanding the structures, by-laws, rules, and roles will help leaders to plan, implement, and monitor their programs and to perform this new role effectively.

1-3-3 Human Resource Development Role:

The human resource development approach empowers people and gives new meaning to all other roles. Development of technical capabilities must be combined with management capability. Training modules are now available (Chamala and Mortiss, 1990; Mortiss and Chamala, 1991) to help develop individual and group management skills. The entire philosophy of human capacity building is to encourage rural communities to understand their personal and group styles of managing themselves and to improve their planning, implementation, and monitoring skills.

1-3-4 Problem-Solving and Education Role:

Problem solving is an important role, but the role is changing from prescribing technical solutions to empowering communities to solve their own problems. This is achieved by helping them to identify the problems and seek the right solutions by combining their indigenous knowledge with improved knowledge and by using their resource properly. Similarly, there is a shift in the education role from lectures, seminars, and training to learning by doing.
and encouraging farmers to conduct experiments and undertake action-learning projects. (Manalili, 1990)

1-4 Extension services

According to Akereololu and Ajayi (1995), extension services are communicative. The ultimate aim of an extension system is to effectively deliver information to end users in a comprehensive and usable manner. Extension services bear great potentials for improving the productivity of natural resources and promoting the right attitude among natural resource managers (Adebayo and Adedoyin 2005). The service is recognized as essential mechanism for delivering information and advice as input into modern natural resource management.

1-5 Extension and Communication

The word ‘communication’ comes from the Latin word communis, its meaning is common. It means that when we communicate, we are trying to establish community with someone through a message. ‘Communication’ then is a conscious attempt to establish community over some idea, fact, feelings and the like, with others. Consequently it is a process of getting a source and a receiver tuned together for a particular message or a series of messages.

For communicating the ideas, you have used a medium (common or talking) The other man has listened to your concept but before understanding the proper meaning he has done the decoding of that concept in his mind and he has made a decision in his mind for this concept, whether this concept should be used or not, this decision is called the effect of communication. As
you are standing there you are observing the man’s reactions and evaluating the “effectiveness of the communication.” This evaluation is called “Feedback”. (Chauhan, 2007).

**1-5-1 Definitions of Communication**

According to Leagans (1961) Communication is a process by which two or more persons exchange ideas, facts, impressions in a way that each gains a common understanding of the meaning, content and use of message.

In another source the procedure by which one mind can affect another (Shannan& Weaver, 1949). It is also taken as a definition of communication.

The term communication stems from the Latin word "Communis", meaning common According to (Rogers and Shoemaker, 1971). Communication is the process by which message are transferred from a source to receiver

According to Udall and Udall (1979), communication is a process by which one person (or group) shares and imparts information to another person (or group) so that both people (or group) clearly understand one another. It can, also be defined as a dynamic and cyclical process by which a message or information is initiated or conceived by a source (or sender) who decodes and purveys it through certain channels to a receiver who decodes the message and, consequently, shows some effect and acts upon it by giving feed back to the sender that it has been received and understood.
Little (1980) defines communication as the process by which information is passed between individuals or organizations by means of previously agreed symbols.

Ewhrudjakpor (1989) defined communication simply as a dynamic process of sharing information between individuals. Adebayo (1997) conceptualized communication as a process of information flow by which ideas are transferred from a source to a receiver with the intent to change his/her knowledge, attitude and/or skills.

Communication is an exchange of ideas, thought or knowledge between at least two people with an intention of changing the behaviour of one another particularly the decoder (Abimbade, 1997). As well it is not just the giving of information, it is the giving of understandable information and receiving and understanding the message. It is the transferring of a message to another party so that it can be understood and acted upon (Eyre, 1983).

Communication is any means by which a thought is transferred from one person to another (Chappell and Read, 1984).

Van den Ban and Hawkins (1996) defined communication as the process of sending and receiving messages through channels which establishes common meanings between a source and a receiver.

Adebayo, (1997) stated that, communication is a key process in information dissemination in agriculture. The development of agriculture requires, among others, a timely and systematic transmission of useful and relevant agricultural information from the technology generation system.
(source) via various communication changes to the intended audience (receiver). It is expected that the client’s changes in behaviour as a result of the message received (effect) be passed back to the source (feedback) for the communication process to be complete.

Age (2009) defined communication as a process in which the participants create and share information with one another in order to reach a mutual understanding. In this process, emphasis is on interactive process of information sharing overtime to the ways in which participants interpret and understand information.

Communication can be defined as the process of transmitting information and common understanding from one person to another (Keyton, 2011).

1-5-2 Communication as a Process

Communication therefore is to be conceptualized as a process of information flow by which ideas are transferred from a source to a receiver with the intent to change his/her skill. Adebayo (2004) opined that communication is a key process in information dissemination. In a similar vein, Udall (1983) suggested that communication can be regarded as a process by which one person (or group) shares and impacts information to another.

1-5-3 Main Elements of Communication Process
Lass Well (1988) emphasized on essential components of elements of communication. According to him, “the act of communication involves who says what, through what channels of communication, to whom, with what …results”. So the main elements are (1) Communication Source (2) Message (3) Channel (4) Receiver or Audience.

1-5-3-1 Communication Source

It is that person, institution or any other origin who initiates the process of communication. A person who starts the talking, is the communication source. When we walk on the road and on the crossing of roads any policeman or red light shows a signal to stop. All these are the sources of communication and we stop as we see it, thus we are receivers of the message. These named extension agents were used as the main agents of liaising between the extension services and the beneficiaries (SPORE 1997).

1-5-3-1-1 Functions of communication source

Selection of the useful and appropriate ideas (message) based on the receiver’s attitudes, needs and other conditions.

Encoding of the message should be clear and effective for the receiver.

Get the information of all the other conditions belonging to the communication process and to arrange them in such as a way so that communication process may be more effective.

Selection of correct communication channel and its proper utilization.
Correct evaluation of the response to communication process and on this basis re-communication.

**1-5-3-1-2 Qualities of communication source**

The communication source should have the ability to select the message and the proper encoding skill. From the point of extension education the communication skill also include an extension worker’s ability to plan a communication strategy. Based on the knowledge of the purpose of communication.

The communication source also should have the information about the receiver or audience and the ability to engage them, the knowledge of communication process and the selection of the communication channels and the knowledge of their use.

The communication source should have the impartial knowledge of his skill as well as his weakness, the ability of evaluating the response and needs of patience to listen to the message of others.

The communication source should have the skill to find out the causes of communication loss and to minimize them these by enough knowledge of the subject. (Chauhan, 2007)

The sender is an individual, group, or organization who initiates the communication. This source is initially responsible for the success of the message. The sender's experiences, attitudes, knowledge, skill, perceptions, and culture influence the message. "The written words, spoken words, and
nonverbal language selected are paramount in ensuring the receiver interprets the message as intended by the sender” (Burnett & Dollar, 1989). All communication begins with the sender.

1-5-3-1-3 Extension Worker as a Leader

Leadership has critical strategic importance since it deals with developing the community. Extension worker in this sense serves as an administrative leader and coordinator for formulating, developing, implementing and evaluating extension programmes as well as develop farmers in managing resources in the rural areas. He guides the extension education activities for farmers as groups or individuals towards the purposeful pursuance of given objectives within a particular situation by means of extension communication methods. (Khalil, et al. 2008)

Radhakrishna et al. (1994) emphasize that the leadership role of extension workers has become an increasingly critical element in the successful performance of extension programmes. Havelock (1973) identified four leadership functions of extension worker, namely, as a catalyst, solution giver, process helper and resource linker. This means extension workers as leaders should raise the awareness of farmers, form functional farmers groups and make decision for solution together with farmers. Extension workers, who possess the desire to lead, may enhance their skills and abilities required for the leadership role that might influence their performance and successes.

Furthermore, the importance of the leadership skills has become widely acknowledged as explanation of personnel and organisational
performance in the various employment sectors. In the context of extension organisation, skilled extension workers are needed to coordinate human, capital and material resources required to accomplish the goals of extension services. So, leadership in extension contexts is indeed a social function which is necessary for the achievement of collective objectives. It can be said that the agricultural extension leadership within a rural community is not just a position in a hierarchy or a chain of commands in extension system, but it involves actions of the extension worker as a leader. It is a kind of mutual interaction between extension worker and farmers. (Khalil, et al. 2008)

1-5-3-2 Message

Message relates to the information which is sent by the communication source to the receiver. Message is the main element of the communication process because without sending the message the communication process cannot be completed. There is a difference between message and idea. The ideas are in the brain of man. So these are the inner qualities. These are sent by some signals (by uttering some words, writing, drawing and painting) to the receiver. Thus, message involves signals that conveys to the communicator or receiver. If we express our feelings by writing, it is a written message. Similarly the feelings are revealed by speaking, it is talking and by drawing painting the pictures become our signals of the message. (Chauhan, 2007)

1-5-3-2-1 Characteristics necessary for a good message:

The message must be in line with the objectives to be achieved, clearly understandable by the audience. Relate to the audience’s intellectual,
social, economical and physical capability. The message must be according to the traditions, needs and desires of the audience. Expression style should be easy. Scientifically the message should be clear, accurate and up to date appropriate to the selected channel.

1-5-3-3 Communication Channel

It is that channel or the medium by which the Receiver gets the message. It may be anything which carries its message to the receiver. In Extension Education, generally, there are a number of communication channels such as radio, television, telephone, meetings, talking exhibition books, bulletins, posters, newspaper, leaflets, and postal-letters etc. Communication channel works as physical bridge between communication source (the sender) and receiver. According to Rogers and Shoemaker (1971), communication channel are the means by which messages travel from a source to a receiver. Usually due to lack of communication channel, the communication process cannot work.

There are several channels of communications available to the extension communicator. It is definite that a single channel cannot be effective or best for all situations.

At the time of selecting the channels of communications, these points must be remembered: The value of the communication medium for example the particular channel should not be of such a high cost that there may be difficulty in using it, Availability of the channel to the communicator i.e., it must available easily, From the communication channels the maximum senses (hearing, taste, touch, sight and smell) of the person, may be utilized,
Suitability of the channel for audience and message and considering the main object of the message, the communication channel must be selected.

1-5-3-3-1 Message treatment

The treatment of message is related to the procedures to be followed or the techniques that are considered to be essential in presenting the messages. The treatment of message, therefore, deals with the design of method for presenting the messages. It should be clear here that the process of designing the method for the treatment of messages does not at all relating to the formulation of the messages or selecting the channels, rather it refers to the technique employed with in the situation provided by a message and a channel.

Its basic purpose has been making the message clear, understandable and realistic to the receivers. It is the way of putting the messages across, within a channel that is what the audience actually sees, hears or does; For example showing of actual specimens of local and improved variety of maize to dramatize the differences between the two. It refers to the authority for the message. The message can be clear, readable and interesting or it can be vague, dull or boring. It can use big and technical words or it can use words the receivers understand. While conducting a meeting, an extension worker places much emphasis on such things as:

1- Making his audience feel at ease in the meeting.

2- Making them feel that they know something.

3- Breaking things down for clarity.
4- Things as his audience do empathy; He treats his message so as to produce these effects and thereby creates a favorable climate for the attention and understanding.

**Procedure of treating the message**

The treatment of message can be varied in number of ways. Few of them are:

**Matters of general organizations**

1- Repetition of ideas.
2- Starting with strong arguments of ideas.
3- Do not leave them until the end of presentation.
4- Explicitly drawing conclusions in comparison to leaving conclusions implicit for the audience to draw.

**Using the symbols and devices etc. for representing ideas**

(Burnett & Dollar, 1989) stated that, In order to convey meaning, the sender must begin encoding, which means translating information into a message in the form of symbols that represent ideas or concepts. This process translates the ideas or concepts into the coded message that will be communicated. The symbols can take on numerous forms such as, languages, words, or gestures. These symbols are used to encode ideas into messages that others can understand. Using of word symbols – speech, Real objects, Specimens, Graphs, Models, Motion pictures, Slides, Charts, Photographs, Drama, Puppets, Songs and Flash cards etc.
Presenting the message through speaking and acting

1- Present only important ideas at one point of time. Many ideas of whatever importance may confuse. Keep in mind the allotted time.

2- Be clear rather than clever.

3- Present the facts – fuzziness means sure dearth to a message.

4- Avoid reading the speech. Communicator who is sure of his subject is liked more.

5- Keep in mind in the audience, which has its personality, try to be responsive to it.

6- Present the idea in the dramatic effect desired besides the content of messages, consider with “Showmanship.” Effective treatment requires sincerity, smoothness, enthusiasm, warmth, flexibility and appropriateness of voice, gestures, movements and tempo.

7- Emphasize use of alternative communicators, wherever possible and appropriate for example, in-group discussion, panel, interviews etc.

Be brief, quit on time. Audience likes the communicator who stops immediately after finishing important ideas.

1-5-3-4 Receiver or Audience

That person or the group of people to whom the message is sent, is called audience or the receiver. In the communication process as the sender is
necessary, the receiver is also very important one of them is not available, the communication process is not possible.

The receiver must have the keen desire, ambition and interest for adopting the new knowledge and also must have the confidence or belief in the communication sources. As well as he should have the capacity to watch and/or hear. (chauhan, 2007)

The extent to which the person comprehends the message will depend on a number of factors, which include the following: how much the individual or individuals know about the topic, their receptivity to the message, and the relationship and trust that exists between sender and receiver. All interpretations by the receiver are influenced by their experiences, attitudes, knowledge, skills, perceptions, and culture. (Burnett and Dollar, 1989)

1-5-4 Other necessary Elements:

1. Encoding:

(Bankovic, 2013) The encoding of a message is a system of coded meanings, and in order to create that, the sender needs to understand how the world is comprehensible to the members of the audience. Any person expresses his ideas or feelings, he reveals it in any way through a signal or symbol etc. i.e., by speaking, writing, painting or the motions of hands and face. The formation of the feelings is called Encoding. Or to reveal the feelings and concepts in the form of signals is called the Encoding. Any person or a thing who/which does this work it is called transmitter. Now it is clear that when
two persons are talking at that time the source or the transmitter is any one person while in the telephonic system there are two different persons. Signals are of various types i.e., by uttering or writing words by the motions of hand, face, legs, painting and by the behaviour, then in every signal two things are necessary:

(1) The signal which is capable to reveal the concept in the accurate form, and

(2) The receiver must understand the signal very well so that he may understand the right meaning of that signal. There may be two or more than two meanings of a signal. First is the verbal or physical that is always written in dictionary or there is any physical thing from that name. Second is the mental or connotative or the meaning that we understand according to its utility and our mental attitude. Now it is clear that the encoding is very important process and the success of the communication depends upon the selection and utility of the signals.

2. Decoding:

The decoding of a message is how an audience is able to understand, and interpret the message. It is a process of interpretation and translation of coded information into a comprehensible form (Bankovic, 2013). As the ideas and feelings are formed into the codes they are called encoding. Similarly to find out the sense of the coding is called decoding just as a source needs an encoder to translate its purpose into a message, to express purpose in a code, the receiver needs a decoder to retranslate, to decode the message and to put into a form that the receiver can use.
In common talking the decoder and the receiver is the same person while in the telephone exchange these are two persons. The decoding has its importance in the communication. The decoder must have the capacity and skill of decoding otherwise wrong understanding may bring wrong results.

3. **Interpretation**: 

To get the ideas or concepts from any message is called decoding but to understand the proper meaning from these achieved ideas is called interpretation. Thus the whole success of the interpretation depends upon the decoding.

4. **Frame of Reference**: 

Here we should understand that the words are themselves meaningless. Human beings contain the meaning of words in their brain. Different people can interpret the same word in different manner. People explain or interpret the words according to their own knowledge, experience, prejudice and attitudes. All these causes (knowledge, experience, opinions and attitudes etc.) or circumstances that are helpful in getting the meaning, are called the frame of reference.

5. **Communication Loss**: 

When any receiver does not get the total message sent by the communication source, this condition is called communication loss. It is
caused only due to communication obstacles, so, it is necessary that the communication obstacles should be minimised. (chauhan, 2007)

6. Communication noise:

Any physical or mental phenomenon which interferes in the way of communication is called communication noise. Communication noise is not due to physical causes, i.e., noise, scarcity of light, scarcity of sound etc. but also due to other mental phenomena which hinder in the way of study. (chauhan, 2007)

7. Response:

When any person receives any message its effect is left upon that person and so there is created inner or the external activity as to laugh while doing some task, to be sad suddenly or to think peacefully, to have a mental tension etc. These effects whether are external or internal the receiver behaves after getting the message and it is called response. Each transmitter wants response of the message after the transmission of the message but sometimes he cannot get the desirable response. If he does not get any type of response then it means that the communication process is not successful and the message did not reach to the receiver.

Feedback is the final link in the chain of the communication process. After receiving a message, the receiver responds in some way and signals that response to the sender. The signal may take the form of a spoken comment, a long sigh, a written message, a smile, or some other action. "Even a lack of response, is in a sense, a form of response" (Bovee&Thill, 1992). Without
feedback, the sender cannot confirm that the receiver has interpreted the message correctly.

Feedback is a key component in the communication process because it allows the sender to evaluate the effectiveness of the message. Feedback ultimately provides an opportunity for the sender to take corrective action to clarify a misunderstood message. "Feedback plays an important role by indicating significant communication barriers: differences in background, different interpretations of words, and differing emotional reactions" (Bovee&Thill, 1992).

1-5-5 Levels of Communication

As per Thayer (1968) the four level of communication are:

1. **Intra-personal**: Referring to communicate with oneself. It mostly occurs in face-to-face situations in which the participants can see, hear or even touch another person. It offers an opportunity for immediate feedback.

2. **Interpersonal**: It may be viewed as an attempt on the part of at least one of the participants, to establish, maintain, exploit or after some relationship vis-a-vis the other, either by adapting himself to the other or by attempting to adapt the other to him in some way. However, the process of communication, which occurs within each participant, not by what, goes on between them, determines the immediate and ultimate consequences. Fenley et al. (1984) believed such visits by Interpersonal communication channel could simply degenerate into personal services by the extension agent or into a personal visits.
3. **Organizational communication**: Organizational communication refers to all those data-flows that sub serve the organizations communication and intercommunication processes in some way.

4. **Inter-organizational communication**: It is the system developed by every organization for communicating with another organization. It should however, be understood that the organizations do not inter communicate as such but the people only do it.

**1-5-6 Communication Need**

The challenge of paramount importance for the change agents is to have needed new technology for their clientele clarifying them clearly to ensure their acceptance and finally motivating the people to secure adoption.

The success of an Extension agent is judged by the ability of effectively communicating innovations. It is to be clear for change agents that the main thrust is to help people to adopt the new technologies to work for them. It needs effective communication. When the basic elements in the communication process as well as their relation to the welfare of the clienteles are understood the change agent may confidently work undoubtedly on correct lines and may improve the communication skill well.

**1-5-7 Communication feedback**

It means (response from the receiver to the source) can be used to reinforce a message and make the subject amend his/her ways without feeling compelled if handled with sensitivity and judgement. Feedback is more effective when it is specific, descriptive, clear, directive towards a behaviour
which the receiver controls and is goal oriented. In recent times experts have strongly recommended the use of participatory approaches. A participatory approach ensures high involvement of the clientele in decision-making (Sinkaiye 2011). Feedback is one of the best ways of getting evidence of effective communication. It enables us to learn about how others see us and how we affect them. It is, thus, an ingredient in the process of evaluation and improving the effectiveness of communication.

1-6 Extension Program

Israel et al. (2011) define an Extension program as "a comprehensive set of activities that are intended to bring about a sequence of outcomes among targeted clients". They clarify that a program is more than a single workshop or activity. Among other things, Extension programs are characterized by:

- a focus on the needs of the target audience,
- the intent to affect participant learning and behavior outcomes,
- multiple activities that are comprehensive in nature, and
- the presence of a formal evaluation.

This exercise will lead to programs in which all the activities work together to achieve an overarching goal or goals. One way of doing this is to start with a clear mental image of the outcomes that you intend to derive from your program.

1-6-1 Strengths of veterinary extension in general

1- Collective experiences.
2- Connectedness to producers, veterinarians, extension personnel, industry, and government.

3- Are practitioners of applied research, when much basic research is being emphasized.

1-6-2 Threats to veterinary extension in general

1- Lack of “thinking outside the box.”

2- Competing priorities of extension along with teaching, research, and service.

3- Lack of funding; this may be “the price of being unbiased”

4- Gaps in empirical evidence on which to base science-based recommendations on animal health, public health, and environmental health issues.

Pickering (1984) suggests that, extension services are generally poorly organized and frequently are subject to political and administrative abuse. He believes that many extension agents tend to be younger than their audience – in general a grave disadvantage in rural traditional societies. According to Awa (1992), lack of sensitivity to local believe and knowledge can severely reduce the ability of technical and extension workers to learn from local peoples’ knowledge and experience, which could otherwise render a development project more worthwhile to all concerned.

1-6-3 Opportunities for veterinary extension in general

Citizens need us now more than ever due to a general lack of understanding of science, Independence and credibility of extension veterinarians can be
leveraged. Extension veterinarians are generalists and have unique capacity to analyze “big picture” items (AAEV, 2008).

1-7 Evaluating extension programs:

Evaluation is the process by which the effectiveness of extension is assessed. It is more than simply finding out what happened; it involves passing judgement on what happened. Was the outcome of the programme good enough? Was it better or worse than expected? Could more have been achieved?

Extension programmes are evaluated to (a) ascertain for the extension organization how well agents perform, so that their suitability for promotion may be assessed; (b) satisfy the government that public money spent on extension is being used effectively; and (c) permit the agent to learn from what has happened. Evaluation is a waste of time unless the results have an influence on future extension decisions.

One approach to evaluation is to ask if the programme's objectives were achieved. This is an important first step and one which is made easier if the programme had clear, precise objectives. If the answer is no, then there is no real basis on which to make improvements in future programmes. It is important, therefore, to ask why things turned out in the way they did. Only when that question is answered can the agent learn from the past. Agents should, therefore, ask questions about the following aspects of the programme. (FAO, 1985)
**Results:** What happened as a result of the extension programme? Were they the results that were expected, and were there any unexpected results?

**Inputs:** Were all the planned inputs available and, if not, why?

**1-7-1 Levels of evaluation:**

There are several levels of evaluation of extension programmes. At the most general level, the effect of extension on agricultural production, family incomes and standards of living can be evaluated. An increase in family living standards is usually an important ultimate goal of rural extension and it is, therefore, important to ask whether any increase has occurred. Evaluation of this kind involves measuring production and farm income for a representative sample of farm families, and then comparing the figures with previous levels. The changes revealed by these figures are then related to the extension inputs and activities during the programme.

However, extension is not the only factor that leads to higher production and living standards; changes in prices and in the availability of inputs are two of the many additional factors that affect the level of crop and of livestock production. Separating the effects of these various factors is a complex task and best left to specialist research and evaluation staff. Nevertheless, the agent should be aware of these economic changes and regularly ask himself how much his extension activities are contributing to the economic well-being of farmers and their families. He should also observe who is benefiting from extension. Is a broad cross-section of the farming
population sharing the benefits, for example, or do one or two particular groups benefit most?

An intermediate level of evaluation is provided by the extension programme itself. Two questions are important here. Did the extension activities take place in the planned sequence and at the right time? Did these activities lead to the expected results? If the answers are negative, the agent should try to understand why. Perhaps he was over-ambitious about how many extension activities he could undertake, or maybe he did not receive the support he needed from other agencies. Whatever the reason, the agent will be able to learn from the evaluation process. He should be able to make more realistic plans in the future to ensure that the necessary support and inputs are provided. (FAO, 1985)

Finally, the agent can evaluate at the level of each extension activity. All extension activities, such as demonstrations, talks or meetings with a farmers' group, have a purpose. The agent should try to check, wherever possible, not only how well the activity itself was conducted but whether the purpose was achieved. This will usually involve finding out whether the extension activity led to any changes in one or more of the following:

1- awareness of a particular idea, possibility or problem;
2- motivation to act in a particular way;
3- knowledge about new farming practices;
4- skills needed to adopt a new practice;
5- behaviour by farmers and their families (such as new farming methods), or by an extension group (such as making an application for funds to
carry out a group project or the preparation of a formal group constitution).

(Anon, 2013) stated that, It’s important that where possible you check that your communication is working - is the right message getting through to the right person? How you evaluate varies. If the communication is very informal then probably your evaluation will be informal. More formal communication will require structured evaluation. Evaluation can seek to measure a variety of elements including raised awareness, improved knowledge and increased skills.

At all levels of evaluation, the agent needs to collect information to compare the situation after the activity with the situation existing before. He will already have assessed the situation before evaluation when deciding on the need for the extension activity. When planning a result demonstration, for example, he will have some idea of how many farmers in the area know about, are interested in, or have already adopted the particular practice that is to be demonstrated. However, he can obtain a more accurate assessment by asking those who attend the demonstration how much they already know and what experience they have had of the practice. By carrying out a similar assessment after the demonstration, he can collect the information he needs for evaluation.

Some effects can be assessed much sooner than others. Immediately after a public meeting, for example, the agent can talk to a few members of the audience and check how clearly they understood what
he was saying. Changes in behaviour, on the other hand, will not happen at once and the agent must wait before checking these.

1-7-2 collection of information for evaluation at the village level

Agent's reports: Whether or not a formal report of each extension activity is required from agents by their extension officers, the agent should make some notes on each activity for his own use, concentrating on his conduct of the activity and on points to note for future occasions.

Supervisors: It is not easy for an agent to assess how well he conducts an extension activity; in particular, he cannot see himself through the eyes of the farmers who attend. It is useful, therefore, to have constructive comments from a supervisor or colleague.

Discussions: Informal discussion with farmers after the extension activity will reveal their immediate reactions. It is often useful to record such discussions using a tape recorder for later transcription and fuller analysis.

Questionnaires: Simple check-lists and questionnaires can be used when the agent has the time and opportunity to carry out a more formal evaluation of extension activities. Before a result demonstration on early planting, for example, the agent could prepare a list of four or five important facts that farmers should know after they have attended. By asking a sample of farmers questions on the facts, before and after the demonstration, the agent can assess its impact on farmers' knowledge.
Observation: Where changes in farming practice are concerned, observation is an accurate source of information. The agent can see whether or not his advice is being adopted on farms in the area.

Many extension organizations have their own formal procedures for evaluation. In some, the agent prepares a detailed plan of work each month on a standard form, showing what he plans to do each day during the month and how these activities fit in with his annual extension programme. The plan of work is then used as the basis for evaluation at the end of the month. Did he do all that he planned? Did he encounter any problems that he should take into account in the future? Is he on target in terms of progress toward his annual extension programme objectives? This procedure may be combined with a monthly meeting of agents in a particular district at which progress and problems in each area are discussed.

Whatever the formal procedures in a particular organization, however, the agent should think of evaluation as an attitude of mind. He should develop a readiness to ask what happened, why it happened and how it could be done better in the future. In this way, he will continue to learn and improve his extension work. (FAO 1985)

1-8 Extension in the Sudan

Sudan began working in the field of veterinary extension under the umbrella of the Department of the Agricultural Extension of the Ministry of Agriculture and Natural Resources, which collided with an obstacle of merging the two Ministries Agriculture and Livestock, where the extension agricultural programmes did not include any activities for livestock sector.
First time was created administration for veterinary extension in Sudan in 1975 under the umbrella of the General Administration of Public Affairs and it evolved to become a public administration to be within the administrations of the Ministry of Livestock, Fisheries and Rangelands. (MARF, 2016)

The General Directorate of Extension, Technology Transfer and Pastoralists Development, Federal Ministry of Animal Resources and Fisheries is responsible for extension matters related to livestock owners, pastoralists and fishermen. The Directorate runs its grassroots programs based on the needs of pastoralists, animal owners, producers and fishermen. It develops strategies and programs of animal resources sector that concentrates on livestock, trans-boundary and zoonotic disease control, in addition to the promotion of animal production and fisheries. The Directorate conducts extension needs assessment surveys, collects technical information from researchers and converts it into simple extension messages, runs field campaigns in collaboration with stakeholders to create ecological awareness among producers, organizes grassroots capacity building programs for pastoralists, participates in rural development and poverty alleviation programs, and makes use of mass media in support of its mandate.

The Directorate comprises three departments, namely Extension and Technology Transfer (has field extension division and research and technology transfer division); Pastoralists’ Development (has pastoralists organizations division and pastoralists services division); and Communication and Documentation (has video and montage division and audio materials division). The Directorate also has a Technical Unit with six (6) veterinary staff (GFRAS, 2016).
1-8-1 State Ministry of Agriculture and Ministry of Animal Resources and Fisheries

There are Ministry of Agriculture and Ministry of Animal Resources and Fisheries, located in each of the 17 states of the country, which have their own extension services. At least in one state, both ministries have been merged to form a single ministry.

Anon, (2012) stated that, the total of human Resources in the Federal Ministry of Animal Resources & Fisheries’ extension system was 38 staff members distributed as; 11 veterinarian in department of Extension and Technology Transfer, 12 veterinarian in department of Pastoralists’ Development, 9 Extension Technician in department of Communication and Documentation and 6veterinarian in Technical Office.

1-8-2 Tasks of Extension and Technology Transfer administration

The central management of extension directorate followed the Department of Field Research and Technology Transfer, and holds the administration of the following tasks: -

- Collect results from applied research centers of livestock and veterinary colleges and animal production and research in form of extension messages that understandable to the target communities.

- Evaluation of changes induced by the practices of the extension messages by the target communities.
- Focus on public awareness programs, and extension through the preparation and implementation of the extension campaigns in coordination with other relevant jurisdiction.

- The provision of veterinary information and extension services through educational means available (different extension channels).

- Curriculum development and implementation of the extension materials and training programs for sectors working in the field of livestock (MARF, 2006).
CHAPTER TWO

MATERIALS AND METHODS

2-1 Study area:

The study was conducted in Khartoum State, Sudan. Khartoum State is situated between latitudes 15° N and 16° N and longitudes 31.5° E to 34° E. The total area extends over approximately 22,142 square kilometer. Khartoum is the capital State of the country. There is a Federal Ministry of Animal Resources, Fisheries and Rangeland where an administration of Veterinary Extension is found. The administration is mandated to prepare the extension policy for the whole country. It supports Veterinary Extension Services in Khartoum State.

Khartoum as a State has State Ministry of Agriculture, Animal Wealth and Irrigation. The State Ministry got one extension department having two units: Agriculture Extension and Veterinary Extension.

The choice of Khartoum State was built on:

1- It is central State with open borders with other States of Sudan. This gives the State a distinct position both geographically and politically. Khartoum, Omdurman and Khartoum North are the major towns and they constitute the capital of the country. They are divided into localities: Khartoum, GabalAwlia, Omdurman, Um Badda, Karari, Bahri, and Sharg-el-Nil.
2- The livestock production is traditional, an intensive and semi-intensive system, mostly privately owned. It is a booming industry with the requirements for standard production levels. The assessment of adequate extension reflects the needs for such services.

3- Besides, livestock flows into the State from rural production areas which also distinct the State by encompassing both intensive and open-system originating animals.

2-2 Study design

1- Data collection was conducted to monitor, analyse and evaluate the facilities available for conducting veterinary extension delivery services, including personal and technical facilities.

2- The study included livestock and other animal species (horses) in Khartoum State.

The data was collected using:

1- Interviews (semi-structured) for the extension service providers.

2- Questionnaires for animal owners.

3- Secondary data from official sources was analysed to evaluate the extension massages, the effect of these massages on livestock production and the assessment of the impact of extension massages.
2-3 Target groups

The target populations of the study were:

a- Extension services providers (Directors, Extensionists, Technical supports).

b- Extension services providers.

2-3-1 Extension services providers

The different groups were chosen to represent the tasks they do in the extension chain.

2-3-1-1 Directors

All veterinarians, (their number was 5) were included. Criterion for inclusion was anyone who sets the plan perused by the government in Federal Ministry of Animal Resources, Fisheries and Rangeland and in the State Ministry of Agriculture, Animal Resources and Irrigation. The interview was designed and administered to this group.

2-3-1-2 Extensionists or Extension agents

Included 25 veterinarians as a purposely selected group, those were provider of the veterinary extension services to all receivers through the appropriate communication channels. The work of the extensionist includes choosing of the extension messages and evaluates the impact of these services. Those were also interviewed.
2-3-1-3 Extension technical supports

Technicians and/or technologists interviewed were 15, of those who participated in messages preparation. Technologies provide critical services and support to extension, their work is documentary using audio-visual technical aids these need high skills and experience.

2-3-2 Extension services recipients

Questionnaires were designed, tested and administered to the groups as indicated in (Table 2-1).

a- Livestock owners: Whose activity is dairy production and feed lot production.

b- Equestrian care-takers: Those who are involved in horse racing and other recreational activities.

c- Poultry Owners: Of poultry farming, including both egg and meat production.

d- Mixed animal owners: Who are engaged in more than one animal production activity.

e- Others (back-yard system owners): With limited number of animals for limited purposed, but have no identified farm.

All the questionnaires in this group were administered to the people who own the animals or the workers who are in contact with animals as care-takers and who receive the veterinary extension services.
Table No 2-1

Extension recipients according to town and animal group activity who were included in this study

<table>
<thead>
<tr>
<th>Towns</th>
<th>Numbers of respondents</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Livestock owners</td>
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<td></td>
<td>Horses</td>
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<tr>
<td></td>
<td>Equestrian care-takers</td>
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<td></td>
<td>Poultry producers</td>
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<td></td>
<td>Mixed farming</td>
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<tr>
<td></td>
<td>Back-yard system</td>
<td></td>
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<td>10</td>
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<tr>
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<td>2</td>
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<tr>
<td>Khartoum</td>
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<td>1</td>
</tr>
<tr>
<td>North</td>
<td></td>
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<tr>
<td>Total</td>
<td>82</td>
<td>13</td>
</tr>
</tbody>
</table>

2-4 Data collection

Primary data was composed of 180 data forms filled between March to May 2016 to analyse the veterinary extension delivery services in Khartoum State, and gathered as follows:

2-4-1 Interviews

45 interview forms filled by the first groups of extension services providers included of 5 directors, 25 extension agents and 15 technical supports. They were drawn from FMAFR and SMAAI. Interviews were to get data on planning messages, preparation, provision and preparedness to deliver it to recipients. (Appendix No1, No 2 and No 3)
2-4-2 Questionnaires

135 questionnaire forms filled by the second group the extension services recipients and the respondents included representatives (convenient samples) from the animal owners found in following localities of Khartoum State; Khartoum, Omdurman and Khartoum north. Questionnaires were to gather data on availability, effect and impact of extension work. (Appendix No 4)

2-4-3 Secondary data collection

Data was collected from 5 years records of annual reports of FMAFR and SMAAI. They were selected for analysis and evaluation of veterinary extension delivery services in Khartoum State. The records were studied to evaluate the extension massages, the effect of these massages on livestock production and the assessment of the impact of extension massages.

2-5 Data analysis:

Data collected from all interviews and questionnaires was analyzed using SPSS program of statistical analysis for Windows version 20. Descriptive statistics was used for all variables such as frequency and percentage in tables and figures.
CHAPTER THREE
RESULTS

The results obtained during this study from interviews, questionnaires and secondary data are shown below.

3-1 Interviews results

3-1-1 Extension Services providers

3-1-1-1 General information

The entire category of directors was interviewed. Their gender was 2 males and 3 females. Their education was 2 graduates and 3 postgraduates. (Table 3.1)

All the directors had more than 10 training courses during their employment. 60% attended training courses inside the country and 40% attended these courses both inside and outside the country. About the subjects of these courses 60% contained specialized subjects and 40% were general and special session subjects. (Table 3.2)

Directors stated that, there are training courses for the personnel in the administration. 80% of these courses were internal and 20% were mixed internal and external courses. About the number of personnel training courses 20% stated that the number is between 1 to 5 and 20% said it is 6 to 10 but the majority 60% determined the number as more than 10 courses. 60% of the
training sessions contained various subjects related to the extension, but 40% noted that the topics were restricted in techniques only.

The 25 respondents of the target population of the extensionists included 1 (4%) male and 24 (96%) females. 52% of them were graduates and 48% postgraduates. (Table 3.1)

All respondents attended training courses, out of whom 88% internal while the 12% attended mixed internal and external training courses. The subjects of these courses were divided into 12% general, 64% specialized and 24% mixed. The number of the training courses attended included 44% less than 5, 20% “between 6 to 10” and 36% more than 10 courses. (Table 3.2)

The majority of these courses 76% in training centers, but 4% in research centers and 20% in both centers. The content of these training courses was always renewed. 96% of the respondents indicated that those training courses had a significant impact to raise the staff performance level, while 4% saw no effect in staff performance.

A total of 15 respondents of technical workers interviewed were 5 males and 10 females. Out of the respondents the result of education level was 6.7% similar for males and females was secondary level. The diploma level males 20% and females 13.3%. In Bachelor degree males were 6.7% and females 26.7%. Males had no postgraduate training and 20% of females had higher degrees.(Table 3.1)

All technical workers had training courses, a total of 80% attended these courses inside the country, 6.7% males and 13.3% females had courses
inboth within and outside the country. Only 1 (6.7%) females had general training courses, 66.7% had specialized training courses composed of 4 (26.7%) males and 6 (40%) females. 6.7% of males and 20% of females had mixed options. 33.3% of technical workers had about 5 training courses, 33.3% of them had between 6 to 10 training courses and the rest 33.3% had more than 10 training courses. (Table 3.2)

Table No (3.1)

Education level for different categories of extension personnel

<table>
<thead>
<tr>
<th>Education level</th>
<th>Item</th>
<th>directors n (%)</th>
<th>Extensionists n (%)</th>
<th>Technical workers n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Final</td>
<td>2 (40%)</td>
<td>3 (60%)</td>
<td>1 (4%)</td>
<td>24 (96%)</td>
<td>5 (33.3%)</td>
</tr>
<tr>
<td>Education</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Secondary</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1 (6.7%)</td>
</tr>
<tr>
<td>Diplomas</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>3 (20%)</td>
</tr>
<tr>
<td>Bachelor</td>
<td>2 (40%)</td>
<td>0 (0%)</td>
<td>1 (4%)</td>
<td>12 (48%)</td>
<td>1 (6.7%)</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>0 (0%)</td>
<td>3 (60%)</td>
<td>0 (0%)</td>
<td>12 (48%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>
Table No (3.2)

Training frequency and type for different categories of extension personnel

<table>
<thead>
<tr>
<th>Item</th>
<th>directors n (%)</th>
<th>Extensionists n (%)</th>
<th>Technical workers n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>2 (40%)</td>
<td>3 (60%)</td>
<td>1 (4%)</td>
<td>24 (96%)</td>
</tr>
<tr>
<td>Site of training courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>1 (20%)</td>
<td>2 (40%)</td>
<td>1 (4%)</td>
<td>21 (84%)</td>
</tr>
<tr>
<td>Both internal &amp; external</td>
<td>1 (20%)</td>
<td>1 (20%)</td>
<td>0 (0%)</td>
<td>3 (12%)</td>
</tr>
<tr>
<td>Subjects of training courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>Specialized</td>
<td>0 (0%)</td>
<td>3 (60%)</td>
<td>1 (4%)</td>
<td>16 (64%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>2 (40%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>6 (24%)</td>
</tr>
<tr>
<td>Number of training courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 5</td>
<td>0(0%)</td>
<td>0(0%)</td>
<td>1(4%)</td>
<td>10(40%)</td>
</tr>
<tr>
<td>6 – 10</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>5 (20%)</td>
</tr>
<tr>
<td>More than 10</td>
<td>2 (40%)</td>
<td>3 (60%)</td>
<td>0 (0%)</td>
<td>9 (36%)</td>
</tr>
</tbody>
</table>
As for technical equipment, 100% of the basic aids were found in the administration except the printing press. All directors stated that equipment was enough to run more than one activity at the same time, but there are no television or radio channels. The Ministry updated the equipment. 13.3% of the technical workers said the updating process is periodically, 66.7% said when available budget and 20% said when damaged.

3-1-1-2 Group information

All respondents in every group of the extension providers had special question in their work in the administration as presented below.

3-1-1-2-1 Policy makers (Directors)

The administrative setup of the whole group was divided into 2 directors and 3 head departments.

As for distribution of the work in Khartoum State, 20% mentioned that there are no centers in the State to implement the extension work and 80% mentioned that there are centers in the State. The number of employees in the extension administration is shown in Table (3.3).
Table No (3.3)

The number of employees in the extension administration as stated by directors*

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Respondents n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 10</td>
<td>1 (20%)*</td>
</tr>
<tr>
<td>11 – 20</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>3 (60%)</td>
</tr>
<tr>
<td>Total</td>
<td>5 (100%)</td>
</tr>
</tbody>
</table>

*This the response of State MAAI

60% of the directors thought that the number of employees to conduct the extension work in the directorate was not enough, while 40% thought that the number is just enough for directorate of the work. The ones who think the number is not enough fill the gap by utilizing other cadres.

80% of the directors approved that there are special vehicles in the administration and the number was between 1 – 2 well equipped vehicles. 20% of them stated no special vehicles were assigned to extension.

Unanimously, the extension administrations used all sources of knowledge to prepare the extension massages.

Administration budget is part of the general ministry budget by submission of the proposed budget to the Ministry of Finance. The ratio
obtained from the proposed budget is presented in (Table 3.4). They stated that the budget was not enough for implementing the work.

**Table No (3.4)**

The percentage ratio obtained for extension projects from the proposed budget through general budget as stated by directors

<table>
<thead>
<tr>
<th>The ratio of budget received</th>
<th>Respondents n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>One third</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>Less than that</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>Total</td>
<td>5 (100%)</td>
</tr>
</tbody>
</table>

Possible administrative reaction to cope with budget deficit is shown in (Table 3.5).

**Table No (3.5)**

Possible administrative reaction to cope with budget deficit

<table>
<thead>
<tr>
<th>Administrative reaction</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancel the projects</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>Search for other funds</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Implementation of the projects according to the funding ratio</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>Total</td>
<td>5 (100%)</td>
</tr>
</tbody>
</table>
Administration relation, with other institutions was approved by all of them and the majority estimated this relationship as good. 80% of directors stated that there is good relationship with the other organizations but 20% haven’t relationship.

3-1-1-2-2 **Extensionists**

All extensionists stated that their work covered all the state and there was no bias to certain locality. 8% of the respondents designed extension messages according to research outcome, 60% according to demand of community, 20% just for the opinion of extensionist and 12% took many ways to design the messages. (Figure 3.1)

**Figure 3.1**

The design of extension messages by extensionists according to required need
Out of 60% prepared the extension messages by annual plan, 8% as contingency disease outbreak, 20% stated that both are important and 12% due to other aspects like animal production and transfer of technologies.

The categories of recipients that receive extension services was found to be composed of 8% animal owners in compounds, 72% chose more than one category (animal owners in compounds, civil society and small producers) and 20% targeted all recipients.

The estimated ratio of the target communities covered by extensionists in Khartoum State is presented in (Table 3.6).

**Table No (3.6)****

The estimated ratio of the target communities covered by Extension agents in Khartoum State

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Respondents n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5&gt;25%</td>
<td>7 (28%)</td>
</tr>
<tr>
<td>25&gt;50%</td>
<td>12 (48%)</td>
</tr>
<tr>
<td>50&gt;75%</td>
<td>5 (20%)</td>
</tr>
<tr>
<td>&lt;75%</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Total</td>
<td>25 (100%)</td>
</tr>
</tbody>
</table>
Most of the extension agents 84% delivered the messages through audio, visual, posters and seminars as communication channels to target communities. A few (about 16%) mentioned all communication channels take place in the delivery system.

The extensionist chose the communication channels according to certain criteria these represents the reason for choosing the appropriate communication channel. The result is shown in (Table 3.7).

**Table No (3.7)**

**The extensionists rationale for their choice of the communication channel**

<table>
<thead>
<tr>
<th>The factors</th>
<th>Respondents n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension programme budget</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>The type of target recipients</td>
<td>15 (60%)</td>
</tr>
<tr>
<td>Opinion of the extensionist</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Budget and target recipients</td>
<td>7 (28%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25 (100%)</strong></td>
</tr>
</tbody>
</table>
Administration staff attributes performance to two factors: 64% thought that the staff was not enough, 56% of those mentioned that the staff is not enough and 8% that they were not trained. On the other side the remaining 36% of respondents thought the staff was 20% trained and 16% enough.

The information source of extension messages was found to be composed of 8% from books, 16% from research reports, 4% direct contact with experts, 8% from Internet sources and 64% used all information sources.

A number of 88% measured the impact of the extension messages, but 12% didn’t measure. The mechanism used in the measurement by 60% is monitoring and evaluation system, 24% used achieving the messages objectives and just adoption of extension messages were used by 4%.

Constraints facing the extension work are presented in (Table 3.8). Included 40% low budget as the main constraints, 20% of them saw the administration had many constraints that affect the extension work, 16% was lack of extension role in all projects, 12% for weak coordination between ministries and target community. While 4% was for lack of human resources, 4% for gender issue and 4% for training availability.
Table No (3.8)

The views of extension workers on constraints to extension

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Respondents n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low budget</td>
<td>10 (40%)</td>
</tr>
<tr>
<td>Lack of human resources</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Gender issue</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Lack of extension role in all projects</td>
<td>4 (16%)</td>
</tr>
<tr>
<td>Training</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Weak coordination between ministries and communities</td>
<td>3 (12%)</td>
</tr>
<tr>
<td>The above</td>
<td>5 (20%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25 (100%)</strong></td>
</tr>
</tbody>
</table>

3-1-1-2-3 Technical workers

About administrative position of technical workers 26.7% males and 46.7% females were technicians, while 6.7% males and 20% females in othersupporting jobs.

Total of 40% technical workers their duty was only for the extension administration. and 40% worked also for other administrations. The impact of working with other administrations for those who work with other
administrations, total of males and females 83.3% said priority for extension work and only 1 (16.7%) said priority to other administrations work.

Out of 6.7% males and 33.3% females participate in preparation of extension messages. Only 3 (20%) females participate in presentation of extension messages. 6.7% males and 13.3% females have a technical role in extension administration. 3 (20%) males had mixed tasks. (Figure 3.2)

**Figure (3.2)**

The role of technical workers in extension administration by gender

56
The number of technical workers in the administration out of 46.7% said the number is about 5, 46.7% said the number is between 6 to 10 and 6.7% said more than 10. Evaluation of the number of technical workers and technical aids; 46.7% of respondents said enough for extension work and 53.3% said enough to do all administrations work.

Obstacles of extension work were stated by the technical workers as 20% males and 33.3% females is low budget, 13.3% said the technicians work with other administrations, 6.7% said limited staff and equipment and total of 26.7% composed of both males and female thought many of these obstacles are the reality. (Table 3.9)

Table No (3.9)

The views of technical staff on obstacles to extension

<table>
<thead>
<tr>
<th>The obstacles</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Low budget</td>
<td>3 (20%)</td>
<td>5 (33.3%)</td>
</tr>
<tr>
<td>Technicians work with other administrations</td>
<td>0 (0%)</td>
<td>2 (13.3%)</td>
</tr>
<tr>
<td>Limited staff and equipment</td>
<td>0 (0%)</td>
<td>1 (6.7%)</td>
</tr>
<tr>
<td>All obstacles</td>
<td>2 (13.3%)</td>
<td>2 (13.3%)</td>
</tr>
</tbody>
</table>
3-2 Questionnaire results

3-2-1 Extension services recipients (Animal owners)

The data obtained from 135 questionnaires was analyzed according to the owner’s locations in Khartoum, Omdurman and Khartoum North. 26.7% of the respondent’s age was below 30, 61.5% was between 31-60 years and 11.9% were more than 60 years.

The population who responded to the questionnaires was composed of 28% illiterates (3.7% in Khartoum, 9.6% in Omdurman and 14.8% in Khartoum North), 5.2% had informal education as (2.2% in Khartoum, 1.5% in Omdurman and 1.5% Khartoum North), 20.7% had primary education (5.9% in Khartoum, 7.4% in Omdurman and 7.4% in Khartoum North), 17.8% had secondary education, 22.2% had graduate education and 5.9% of owners had higher degrees. (Figure 3.3)

Figure 3.3

The profile of education level of animal owners in the study area during the study period by location
The diversity of animal species owned contributed to the formation of different production systems in Khartoum State as shown in (Table 3.10). It was observed that cattle were the major species (38.5%) in diary and fattening system, small animals were 14.8%, camels were 2.2%, poultry were 4.4%, horses 11.1% and 28.9% of the owners had mixed animals species.

Table No (3.10)

The types of animals owned by respondents

<table>
<thead>
<tr>
<th>Animal species</th>
<th>Location</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Khartoum n (%)</td>
<td>Omdurman n (%)</td>
</tr>
<tr>
<td>Cattle</td>
<td>12 (8.9%)</td>
<td>16 (11.9%)</td>
</tr>
<tr>
<td>Sheep &amp; goats</td>
<td>7 (5.2%)</td>
<td>10 (7.4%)</td>
</tr>
<tr>
<td>Camels</td>
<td>0 (10%)</td>
<td>3 (2.2%)</td>
</tr>
<tr>
<td>Poultry</td>
<td>4 (3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Horses</td>
<td>10 (7.4%)</td>
<td>2 (1.5%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>13 (9.6%)</td>
<td>13 (9.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>46 (34.1%)</td>
<td>44 (32.6%)</td>
</tr>
</tbody>
</table>

More respondents keep animals in farms (91, 67.4%), others in household (backyard) (26, 19.3%) and 18 (13.3%) in others (for example Equestrian).
About the extension services a total of 50.4% received extension services distributed according to the location as (17% Khartoum, 20% Omdurman and 13.3% Khartoum North). A total of 49.6% did not receive any extension services (Table 3.11).

**Table No 3.11**

**The provision of extension services in the field by location**

<table>
<thead>
<tr>
<th>Receive extension services</th>
<th>Location</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Khartoum (%)</td>
<td>Omdurman (%)</td>
</tr>
<tr>
<td>Yes</td>
<td>23 (17%)</td>
<td>27 (20%)</td>
</tr>
<tr>
<td>No</td>
<td>23 (17%)</td>
<td>17 (12.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>46 (34.1%)</td>
<td>44 (32.6%)</td>
</tr>
</tbody>
</table>

Most of the owners who received the extension services from extensionists 57.4% (14.7% from Khartoum, 27.9% from Omdurman and 14.7% from Khartoum North). A total of 8.8% received extension services from neighbor farms (2.9% Khartoum, 4.4% Omdurman and 1.5% Khartoum North). 2.9% owners in Khartoum received the extension services from leading producers.
21 (30.9%) answered from others distributed as (13.2% Khartoum, 7.4% Omdurman and 10.3% Khartoum North). Table 3.12

Table No 3.12

The services providers of the extension messages by location

<table>
<thead>
<tr>
<th>Services providers</th>
<th>Location</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Khartoum n (%)</td>
<td>Omdurman n (%)</td>
</tr>
<tr>
<td>Extensionists</td>
<td>10 (14.7%)</td>
<td>19 (27.9%)</td>
</tr>
<tr>
<td>Neighbors farm</td>
<td>2 (2.9%)</td>
<td>3 (4.4%)</td>
</tr>
<tr>
<td>progressive producers</td>
<td>2 (2.9%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Others</td>
<td>9 (13.2%)</td>
<td>5 (7.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>23 (33.8%)</td>
<td>27 (39.7%)</td>
</tr>
</tbody>
</table>

These services were provided to the recipients as 17.6% (7.4% Khartoum, 4.4% Omdurman and 5.9% Khartoum North). 82.4% said sometimes receive extension services (26.5% Khartoum, 35.3% Omdurman and 20.6% Khartoum North).
41% of total owners said the extension messages focused on animal health, a total of 7.4% said the messages focused on animal production, only 1 owner had messages in zoonosis and 50% had mixed topics. The result is shown in details according to owner’s location in (Figure 3.4).

**Figure 3.4**

![Extension messages by location as mentioned by respondents during the study](image)

The animal owners receive extension messages through communication channels, following the channels that deliver the extension messages to owners. 22 (34.4%) of the respondents had extension through field visits and direct contact. Of the audio channels 11 (17.2%), 8 (12.5%)
through visual channels, 3 (4.7%) through posters and brochures, 12 (18.8%) through seminars and 8 (12.5%) of the respondents took their services through social media. Figure 3.5

**Figure 3.5**

Channels that deliver the extension messages as mentioned by respondents during the study

The respondents choose the best communication channels to them for several factors: their education level; availability of channel etc. 50.4% of owners chose the field visit and extension meetings as the desirable channel they agreed that they will help extensionists to see the field problems and find out solutions. 15.6% preferred audio channel due to the availability. A few of
them 5.2% preferred visual channels. 11 of the owners 8.1% said prefer posters and brochures because they keep it for a long time. 8.9% said seminars. 6.7% prefer demonstration. 5.2% said the social media is the best channel due to availability of phone messages and internet. Figure 3.6

Figure 3.6

The preferred communication channels by respondents

The extension agents visit 64.7% of animal owners in their location, while the rest of respondents 35.3% did not see the extension agents in their location. The respondents were able to assess the benefits of extension messages which gives a picture of extension services benefits. 51.5% said the messages were useful, 35.3% as moderately useful and 13.2% not useful. Their reasons for the low benefits were 30% the channels were not suitable, 40% inappropriate time and 30% their answered was for several reasons.
The delivery rate of extension messages was 10.3% monthly, 13.2% weekly, 2.9% every two weeks and 73% their answer was not regular.

60.3% of animal owners reported the extension messages were up to date and solve the problems by, repeated by 22.1% and the rest answered others.

A total of 64.7% of respondents said the role of extensionists in the field is just presentation of the extension messages. 35.3% said the extensionists used Monitoring and Evaluation system to presented messages. Figure 3.7

**Figure 3.7**

<table>
<thead>
<tr>
<th>Khartoum</th>
<th>Omdurman</th>
<th>Khatroum North</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.0%</td>
<td>20.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>20.0%</td>
<td>15.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>15.0%</td>
<td>10.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>10.0%</td>
<td>5.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**The role of extensionists in the field by owner’s location**

A total of 31 (45.6%) of the respondents answered yes the extensionists ask about the topics of the extension messages, while 37 (54.4%) of respondents never ask about the topics of extension messages. And those who participate in choosing the extension topics by opinion poll by 67.7% of them, 19.3% by group discussion and 13% by questionnaires.
9.6% of respondents thought the extension is not important; a number of them had no idea about extension and part of them was not convinced about the importance of extension. 91.4% thought the extension is very important to them to improve their production and raise their knowledge about animal health and zoonosis.

3-3 Secondary data analysis

The data obtained from the two Ministries, the Federal Ministry of Animal Resources, Fisheries and Rangeland and the State Ministry of Agriculture, Animal Resources and Irrigation in Khartoum State. It is showed that the annual reports for five years (2011 to 2015) were limited. Nevertheless, there is available information for evaluating the veterinary extension services in Khartoum State. (Table 3.13 and Table 3.14)

The two tables (3.13 - 3.14) illustrate that in five years the number of extension messages, communication channels delivery of these messages, target populations and assessment of activities and/or comments showed the effect and/or the impact of these messages.

The FMAFR table (3.13) showed that absence of any extension activity in 2011 and 2012. From 2013 the Ministry policies changed positively towards the extension administration this clearly appeared in the number of extension messages, 20 messages in 2013, 235 messages in 2014 composed of 232 radio episodes and 3 extension films and in 2015 the number of messages was 34 (32 radio episode, 1 training course and only one field demonstration). The Federal administration used different communication channels to deliver
these messages. They focused only on livestock owners as target receivers and the other species of animals were not included.

The topics of the extension messages included animal health, animal production, farm management and in 2014 only one radio episode on zoonosis. In all year’s records, they did not measure the effect or the impact of these messages and no comments were found. (Table 3.13)

In the SMAAI (table 3.14) it appears that there is a gradual increase in the number of the extension messages through the years.

The total number of extension messages was 30 messages in 2011, 101 messages in 2012, 192 messages in 2013, 2276 messages 2273 of them were field visits those in 2014 and 7339 follow-up field visits in 2015. Different communication channels were used in messages delivering system. The State administration focused on livestock owners as the main target population. Records of 2015 added new target receivers including tanneries and fish producers. Similar to the Federal one there was no measures of the effect or impact of the extension messages.

Table No (3.13)

Extension messages delivered by the Federal Ministry (FMAFR) for 5 years annual reports (2011-2015)
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of messages</th>
<th>Communication channels used</th>
<th>Target population</th>
<th>Assessment on activities, comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>0</td>
<td>Not found</td>
<td>Not found</td>
<td>Not done</td>
</tr>
<tr>
<td>2012</td>
<td>0</td>
<td>Not found</td>
<td>Not found</td>
<td>Not done</td>
</tr>
<tr>
<td>2013</td>
<td>20</td>
<td>1 Poultry exhibition</td>
<td>1-Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Extension film</td>
<td>2-Veterinarians</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Brochure</td>
<td>3- Fish producers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 training courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 Extension meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>235</td>
<td>232 Radio episode</td>
<td>Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Extension film</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>34</td>
<td>32 Radio episode</td>
<td>Livestock producers</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Demonstration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table No (3.14)

Extension messages delivered by the State Ministry (SMAAI) for 5 years annual reports (2011-2015)
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of messages</th>
<th>Communication channels used</th>
<th>Target population</th>
<th>Assessment on activities, comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>30</td>
<td>4 Radio episodes</td>
<td>Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Television episode</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 Extension meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 newspaper articles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>101</td>
<td>93 Filed visit</td>
<td>1-Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Extension Bulletin (2700)</td>
<td>2-Fish producers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Extension camp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Radio episode</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 producers school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>192</td>
<td>187 Farm visits</td>
<td>Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Market visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Extension camp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Extension meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2276</td>
<td>2273 Field visit</td>
<td>Livestock owners</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Extension camp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Extension campaigns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>7339</td>
<td>Follow-up field visits</td>
<td>Diary, poultry,</td>
<td>Not done</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>slaughters,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tanneries and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fish Producers</td>
<td></td>
</tr>
</tbody>
</table>

**CHAPTER FOUR**

**DISCUSSION**

Animal owners in Sudan practice traditional production methods in remote areas as a private sector production system. A growing modern production
also exists in urban areas. Veterinary extension is important to assist the veterinary services in improving production and productivity.

The study showed that the number of directors was very limited, as they were only 5. On the other hand although the extensionists number was fair, yet the technical support staff was also limited. The number of females was significantly higher than males. The females in the extension administration had higher degrees than males who just had University degrees. All the staff had training courses in different subjects and sites but there was no systemic planning of these courses to improve the staff performance. (Khalil et al. 2008) stated that, skilled extension workers are needed to coordinate human, capital and material resources required to accomplish the goals of extension services. This statement was not found to be fulfilled during this study. Khartoum State with its large area needs a suitable number of well-trained extensionists to fulfill all veterinary extension services needed to improve livestock performance.

According to Bello and Obinne (2012), Feedback is one of the best ways of getting evidence of effective communication. It enables us to learn about how others see us and how we affect them. It is, thus, an ingredient in the process of evaluation and improving the effectiveness of communication. Feedback is more effective when it is specific, descriptive, clear, directive towards a behaviour which the receiver controls and is goal oriented. In contrast this study showed that there was no evaluation system about the effect or impact of the extension messages in the FMAFR and SMAAI records for 5 years ago.
The study stated that 64% of the extensionists evaluated the performance of the extension administrations staff as not enough and 56% mentioned the reason of this insufficiency to be that the number was less than the actual needed, similarly 60% of the policy makers thought that the number of employees to conduct the work in the provision was not enough. This fact was clear in the estimated ratio of the target communities covered by the extension agents in Khartoum State to be between 25 to 50 % by 48% of the extensionists. In a related study (Khoury, 2011) summarized that, weak veterinary extension was also caused by the insufficient number of veterinarians working in the region and their limited practical experience interacting effectively with animal producers.

Only 30% of the animal owners in Khartoum State were illiterates and the rest 70% had a degree of education. This can facilitate the communication process and broaden the choices of communication channels to target communities. Furthermore, 60.3% of respondents stated that the extension messages were updated and solve the problems. This agrees with Chauhan (2007) that the wide differences among farm people and their problems demand need a wide variety of teaching methods.

It was confirmed that the basic technical equipment was available, but there was lack in communication channels, especially radio and television channels which do not exist, and can deliver the extension messages to 25.8% of the animal owners. This is contrary to the result of (60%) of the extensionists who designed the extension messages mainly according to demand of community and the extensionists didn’t ask approximately half of
the respondents that receive the extension services about the topics they needed. So all this affect the adoption and dissemination of the innovations and technologies to different communities. In a related study, Bello (2007) further asserted that owners could reject many apparently attractive and supposedly appropriate technologies either through non adoption or discontinuation of earlier adopted technologies because they were not really appropriate or that the method of technology transfer was not appropriate.

It was found that 67.4% of respondents kept their animals in farms and about 20% put animals in household (back-yard). On the other hand the topics of extension messages in the annual reports of the two ministries (FMAFR & SMAAI) poorly address zoonosis. Approximately half of the respondents do not receive any extension services and about 30% from those had the services from other source. 35.3% of the respondents didn’t see the extensionists in their location; this explains the non-comprehensive coverage of veterinary extension administrations in the field. This was suggested to be managed by Manalili (1990), where the problem solving is achieved by helping communities to identify the problems and seek the right solutions by combining their indigenous knowledge with improved knowledge and by using their resources properly. This was lacking in the activities of the reviewed ministries.

About 73% of the respondents stated that the delivery rate of the extension messages was not regular, and a high percentage of their answer reflected that it was once. This disagrees with 60% of the extensionists who prepared the extension messages according to an annual plan. The gap between
extensionists and recipients reflect that they do not plan together, or communities do not participate in planning.

The annual reports stated that, the most used communication channels in FMAFR was radio because they targeted the animal owners in the whole country, but the most communication channels used in SMAAI was field visit because their work is restricted to Khartoum State only. This agreed with the opinion of 50.4% of the respondents choosing field visits as the desirable communication channel, and 60% of the extensionists designed extension messages according to demand of community and also the extensionists rationale for their choice of the communication channel is the type of target communities. This agrees with Chauhan (2007), the communication source should have the information about the receivers and the ability to engage them, the knowledge of communication process and the selection of the communication channels and the knowledge of their use.

Many problems and constrains have weakened the ongoing extension programmes, it was noticeable that the respondents of the administration workers unanimously agreed that the low budget is the main constraint of the extension work and significant proportion explained that there are several obstacles to impede the work of veterinary extension services. About 20% said lack of extension role in all projects. These results mean that extension administration is totally neglected by the general Ministry policies especially before 2013; this clearly appeared in the records. The 2011 & 2012 records showed that there was no extension activity at-all in Federal ministry and weak activity in the State ministry. The veterinary extension administrations
are not just neglected but excluded from the attention of the ministry's policies which is often considered the reason; the veterinary extension administrations are not generating inputs to the ministry. This agrees with Khoury (2011) who mentioned that veterinary extension presently faces many problems due to the weakness and/or absence of effective extension services, in addition to the absence of well-defined programmes to guide and support animal production.

**Conclusions:**

It can be concluded that extension constitutes a significant and important part in providing veterinary services to all target communities.
The extension messages on zoonosis to communities were lacking.

There was no co-ordination between the FMAFR and SMAAI and the veterinary extension administrations and the targeted communities.

The role of veterinary extension services is lacking in the field and technology transfer is absent.

Absence of follow up, Monitoring & Evaluation system and measuring of the effect and impact of the extension messages in the two ministries.

**Recommendations:**

Based on the results obtained it is recommended that further detailed studies be carried to determine the needs to improve the veterinary extension services in Khartoum State and all over the Sudan.

The field of veterinary extension in general needs more attention from decision makers and it is strongly recommended to use participatory approaches to ensure high involvement of the target communities in decision-making.

Strengthening monitoring and evaluation system and implement the Monitoring & Evaluation system to the extension administrations activities.

The veterinary extension services need more attention by improving the extension administrations by increasing the human resources, co-ordination between the communication elements and logistics to be available for veterinary extension services.

**REFERENCES**


Research. [http://documents.mx/Documents/Veterinary-Extension Education.html](http://documents.mx/Documents/Veterinary-Extension Education.html)


Appendices

Appendix (No 1)

Questionnaires about evaluation of veterinary extension services in Khartoum state, Sudan.
(Directors)

1- Gender  
a- Male ( )   b- Female ( )

2- The administrative setup  
a- Director ( )   b- Assistant Director ( )  
b- Department head ( )   d- others ( )

3- Education  
a- Graduate ( )   b- Postgraduate ( )

4- Distribution of the work in the State  
a- Centers ( )   No centers ( )

5- If yes, where is the distribution of these centers?  
a- Khartoum ( )   b- Khartoum north ( )   c- Omdurman ( )   d- All ( )

6- Did you get any training courses?  
a- Yes ( )   b- No ( )

7- If yes, where?  
a- Internal ( )   b- External ( )   c- The two options ( )

8- The subjects of the training courses  
a- General ( )   b- Specialized ( )   c- The two options ( )

9- Number of the training courses  
a- 1-5 ( )   b- 6-10 ( )   c- More than 10 ( )

10- Are there training courses for the department personnel?  
a- Yes ( )   b- No ( )

11- If yes, where?  
a- Internal ( )   b- External ( )   c- the two options ( )
12 - What is the number of training courses?
a- 1-5 ( ) b- 6-10 ( ) c- More than 10 ( )

13 - What is the content of these training sessions?
a- General ( ) b- Extension ( ) c- Techniques ( ) d- Many options ( )

14- What is the number of employees in the department?
a- 5- 10 ( ) b- 10-20 ( ) c- More than 20 ( )

15- The number of employees to conduct the work in the administration?
a- Enough to work ( ) b- Not enough ( )

16- If the answer is not enough, how do you fill the gap?
a- Utilizing other cadres ( ) b- Deficit in the work occurs ( )
c- Others ( )

17- Technical Equipment:

<table>
<thead>
<tr>
<th>Technical Equipment</th>
<th>Found</th>
<th>Not found</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Cameras</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2- Digital Cameras</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3- Studio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4- Microphones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5- Video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6- Printing press</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18- Is this equipment enough to run more than one activity?
   a- Yes ( ) b- No ( )

19- Is there a television channel or radio?
   a- Yes ( ) b- No ( )
20- Are there special vehicles in the department?  
a- Yes (  )  b- No (  )  

21- If yes, how many?  
a- 1-2 (  )  b- 3-5 (  )  c- 6-10 (  )  

22- Are these vehicles well equipped?  
a- Yes (  )  b- No (  )  

23- The sources of knowledge:  
a- Books (  )  b- Internet (  )  c- Research report (  )  
d- Many options (  )  

24- Administration budget:  
a- General budget for the ministry (  )  b- External financial support (  )  
c- Others (  )  

25- What is the percent ratio obtained from the proposed budget?  
a- All (  )  b- Half (  )  c- one third (  )  d- less than that (  )  

26- Is this ratio enough for the work?  
a- Yes (  )  b- No (  )  

27- If not, how do you cope with the budget deficit?  
a- Cancel projects (  )  b- Search for other funds (  )  
c- Implementation of the projects according to the funding ratio (  )  

28- Grading of the relationship of administration with other institutions:
<table>
<thead>
<tr>
<th>No</th>
<th>Relationship</th>
<th>Excellent</th>
<th>Good</th>
<th>Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Administration of agriculture extension in Ministry of Agriculture, Animal Wealth and Irrigation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td>Organizations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td>Universities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-</td>
<td>Veterinary Hospitals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-</td>
<td>Poultry Companies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29- Rating the relationship of administration with other organization:

<table>
<thead>
<tr>
<th>No</th>
<th>Relationship</th>
<th>Excellent</th>
<th>Good</th>
<th>Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Sponsors Union</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td>Veterinary Medical Association</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td>Agriculture Union</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-</td>
<td>Veterinary council</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30- Is there any information to be added?

..............................................................................................................................

..............................................................................................................................

Appendix (No 2)

Questionnaires about evaluation of veterinary extension services in Khartoum state, Sudan.

(Extensionists)
1- Gender  
a- Male (   ) b- Female (   )  

2- Education  
a-  Graduate (   ) b - Postgraduate (   )  

3- Distribution of the extension work  
a- Confined to certain areas(   ) b- Cover all the state (   )  

4- Did you get any training courses?  
a- Yes (    ) b- No (    )  

5- If yes, where is it?  
a- Internal (    ) b- External (    ) c- The tow options (    )  

6- The subjects of the training courses  
a- General (    ) b- Specialized (    ) c- The tow options (    )  

7- Number of the training courses  
a- 1-5 (    ) b- 6-10 (    ) c- More than 10 (    )  

8- Training courses in  
a- Research centers (    ) b- Training centers (    )  

c- The two options (    )  

9- The subjects of the training courses  
a- Repeated (    ) b- up-dated (    ) c- New (    )  

10 - Are these courses developing the staff performance?  
a- Yes (    ) b- No (    )  

11- How do you design the extension masses?  
a- Research outcome (    ) b- Demand of community (    )
12 – Preparation of extension massages according to?
a- Annual plan ( ) b- disease outbreaks ( )
c- Others ( ) d- a and b ( )

13- What are the categories of recipients that receive extension services?
a- Animal owners in compounds ( ) b- Civil society ( )
c- Small producers ( ) d- Private companies ( ) e- Veterinarians ( )
f- All options ( ) g- a, b and c ( )

14- What is the percent of the target communities covered in Khartoum state?
a- 5>25% ( ) b- 25>50% ( ) c- 50>75% ( ) d- <75% ( )

15- What are the communication channels used to deliver extension messages?
a- Direct contact ( ) b- Audio ( ) c- Visual ( )
d- Posters and Brochures ( ) e- Seminars ( )
f- Demonstrations ( ) g- Social media ( ) h- All channels ( )

16- What is the rationale for choice of the appropriate communication channel?
a- Extension program budget ( ) b- The type of target recipients ( )
c- Opinion of extensionist ( ) d- a and b ( )

17- Evaluate the number of administration staff
a- Enough ( ) b- Not enough ( )

Mentioned the reason/s?
a- Training (    ) b- Number of staff (    ) c- all reasons above (    )

18- What is the information source of the extension massages?

a- Books (    ) b- scientific research (    )
c- Previous massages (    ) d- Direct contact with the experts (    ) e- Internet sources (    ) f- All sources above (    )

19- Do you measure the effectiveness of the extension messages?

a- Yes (    ) b- No (    )

20- If the answer is yes, how do you measure it?

a- Achieving the messages objectives (    )
b- Monitoring and Evaluation system (    )
c- Adoption of extension messages (    )

21- In your opinion, what are the constraints of extension work?

a- Low budget (    ) b- Lack of human resources (    )
c- Gender issue (    ) d- Lack of extension role in all projects (    )
e- Weak relationship between communication elements (    )
f- Training (    ) g- All points (    )

22- Is there any information to be added?

....................................................................................................................................................................................

Appendix(No 3)

Questionnaires about evaluation of veterinary extension services in Khartoum state, Sudan.

(Technical Workers)
1- Gender
   a- Male (      ) b - Female (      )

2- Education
   a- Primary (      ) b- Secondary (      ) c- diploma (      )
   d- Bachelor (     ) e- Postgraduate (     )

3- Administrative position
   a- Technician (    ) b- Technical (      ) c- Others (      )

4- The work duty is for?
   a- Extension administration only (      )
   b- Other administrations also (      )

5- If you are working with other administrations what is the impact of this?
   a- Priority for Extension work (      )
   b- Priority to other administrations work (      ) c- Others (      )

6- What is your role in the extension administration?
   a- Participate in preparation of the extension massages (      )
   b- Participate in presentation of extension massages (      )
   c- Technical work only (      ) d- Others (      ) e- Mixed tasks (      )

7- Do you get any training courses?
   b- Yes (      ) b- No (      )

8- If yes, where?
   b- Internal (      ) b- External (      ) c- The tow options (      )

9- The subjects of the training courses
   b- General (      ) b- Specialized (      ) c- The tow options (      )
10- Number of the training courses
b- 1-5 (  )  b- 6-10 (  ) c- More than 10 (  )

10 - The training courses is
a- Periodically (  ) b- Only on modern devices (  ) c- Others (  )

12 - Technical Equipment:

<table>
<thead>
<tr>
<th>Technical Equipment</th>
<th>Found</th>
<th>Not found</th>
<th>Any comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Cameras</td>
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<tr>
<td>2- Digital Cameras</td>
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<td>3- Studio</td>
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<td>4- Microphones</td>
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<td>5- Video</td>
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<tr>
<td>6- Printing press</td>
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</tbody>
</table>

13- Does the ministry update the technical equipment?

a- Yes (  )  b- No (  )

14- If the answer is yes, how long is updated?
a- Periodically (  ) b- Available budget (  ) c-When damage (  )
d- Others (  )

15- The number of technical workers in the administration

a- 1-5 (  )  b- 6-10 (  ) c- more than 10 (  )

16- Evaluation of the number of technical workers and technical equipment

a- Enough for extension work (  )
b- Enough for all administrations work (  )
c- Not enough for extension work (  ) d- Others (  )
17- In your opinion, what are the obstacles of extension work?

a- Low budget (     )  b- Technicians work with other departments (   )

b- Limited staff and equipment (     )  d- Training (     )

e- Many options (     )

18- Is there any information to be added?

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Appendix (No 4)

Questionnaires about evaluation of veterinary extension services in Khartoum state, Sudan.

(Animal owners)

1- Age

b- 15-30 (     )  b- 31-60 (     )  c- More than 60 (     )
2- Education
   a- Illiterate ( ) b- Informal ( ) c- Primary ( )
   d- Secondary ( ) e- Graduate ( ) f- Postgraduate ( )

3- Location in the state
   a- Khartoum ( ) b- Omdurman ( ) c- Khartoum North ( )

4- Type of animal species
   a- Cattle ( ) b- Sheep and goats ( ) c- Camels ( )
   d- Poultry ( ) e- Horses ( ) f- Mixed ( )

5- What is the type of animal raring system?
   a- Household ( ) b- Farms ( ) c- Others ( )

6- Do you receive any extension services?
   a- Yes ( ) b- No ( )

7- If yes, from where you receive these services?
   a- Extensionist ( ) b- Neighbors farm ( )
   c- Leading producers ( ) d- Others ( )

8- Is the provision of extension services?
   a- Always ( ) b- Sometimes ( )

9- What are the topics of extension massages?
   a- Animal health ( ) b- Animal production ( )
   c- Zoonosis ( ) d- Mixed ( )

10- What are the channels that deliver the extension massages?

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11 – What do you think is the best of these channels?
b- Field visits and direct contact ( ) b- Audio ( ) c- Visual ( )
d – Posters and Brochures ( ) e- Seminars ( )
f- Demonstrations ( ) g- Social media ( )

12 – Does the extensionist visit you on your location?
a- Yes ( ) b- No ( )

13 – Assess the benefits of extension massages?
a- Useful ( ) b- Moderately useful ( ) c- Weak usefulness ( )
d- Not useful ( )

14- If the benefit is below the average, in your opinion what is the reason?
a- The language ( ) b- The topics is not important ( )
c- Channel is not suitable ( ) d- Inappropriate time ( )
e- Several reasons ( )

15- What is the recurrence rate of the extension massages you receive?
a- Monthly ( ) b- weekly ( ) c- every two weeks ( )
d- Not regular ( )

16- The extension massages that offered to you
a- Up-dated and solve problems ( ) b- Repeated ( )
c- Others ( )

17- The role of extensionist in the field?
a- Presentation the extension massages only ( )
b- Monitoring & evaluation ( ) c- The two options ( )

19- Does the extensionist ask you about the topics of extension massages?
a- Yes ( ) b- No ( )
20- If the answer is yes, how?
a- Questionnaires ( ) b- Panel discussion ( ) c- Opinion poll ( )
21- Do you think the veterinary extension is important to you?
a- Yes ( ) b- No ( )
22- If yes, what is the importance?
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23- If not, why?
.................................................................
24- Do you have any addition?
.................................................................
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