Sudan University of Science and Technology

College of Graduate Studies

Effect of Extension Campaigns on Livestock Producers Knowledge and Skills (Case Study South Kordofan State)

تأثير الحملات الإرشادية على معارف ومهارات منتجي الثروة الحيوانية (دراسة حالة ولاية جنوب كردفان)

A thesis Submitted for Partial Fulfillment of the Requirement for Master Degree in Animal production in the Tropics

Prepared By: Rugaia Hamad Jumaa

Supervisor: Dr. Hassan Abdelnabi Allajabu

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بسم الله الرحمن الرحيم

Dedication

To The Soul of My Mother

To My Lovely Family

To All My Friends, Colleagues and Relatives

To everyone who Encouraged Me

With My Deep Respect

ACKNOWLDGMENT

By the blessing and grace of God, the study completed. Firstly, I give thanks to Allah who gave me the strength to complete this work.

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ABBREVIATIONS

A.I: Artificial Insemination

B.Q: Black Quarter

F.M.D: Foot and Mouth Disease

H.S: Hemorrhagic Septicemia

TOT: Training of Trainers

ABSTRACT

This study aimed at evaluating the effect of extension campaigns activities on livestock producers' knowledge and skills in South Kordofan State. Data were collected from 100 respondents randomly selected from six villages, purposively selected based on implementation of campaigns. A questionnaire was used to collect the primary data, while the secondary data were obtained from relevant sources. The collected data was analyzed in the form of frequencies, chi- square, correlation and analysis of variance "ANOVA". The study findings, revealed that the extension campaigns have good effect to acquiring knowledge to the livestock producers, and the utilizing of lecture accompanied with audio visual aids such as video show is more effective method according to the respondents opinion. 67% of the respondents did not participate in campaigns, 66.7% of respondents acquired knowledge in a good level, while 66.6% did not acquire any skills according to the respondents opinion, 73% of the respondents depend on the natural pasture for feeding their animals in addition to offering few concentrate, Chi- square test reflected significant relationship between participation and respondents knowledge about A.I, pregnant and lactated animals feeding, while there was no significant relationship between participation and respondents knowledge about animal health, correlation was observed between participation and the experience but correlation was not observed between participation and the (income , heard size. There was no significant relationship between the participation and cheese making skill. ANOVA reflected a significant effect of the education level on the participation while the breeding purpose has not effect on the participation.

The study recommended that lectures and video shows must be used as main extension methods in livestock sector. Also an intensive awareness program should be made about A.I. There necessity of early advertising about the campaigns that accompanied with training to acquiring skills specially cheese making.

ملخص الدراسة

هدفت هذه الدراسة الى تقييم أثر أنشطة الحملات الارشادية على معارف ومهارات منتجي الثروة الحيوانية بولاية جنوب كردفان. تم جمع البيانات من 100 مبحوث تم اختيارهم عشوائيا من 6 قرى بناءا على تنفيذ الحملات الإرشادية باستخدام الاستبيان لجمع البيانات الأولية بينما البيانات الثانوية تم الحصول عليها من المصادر ذات الصلة. تم تحليل البيانات في شكل تكرارات، مربع كاى، الارتباط، وتحليل التباين.

توصلت الدراسة الى ان الحملات الإرشادية لها أثر جيد لإكساب المعارف لمنتجى الثروة الحيوانية، وان استخدام المحاضرات المصحوبة بالوسائل السمعية البصرية مثل عروض الفيديو طريقة فعالة جدا حسب راي المبحوثين. 67% من المبحوثين لم يشاركوا في الحملات، 66.7% من المبحوثين اكتسبوا معارف بمستوى جيد بينما 66.6% لم يكتسبوا اى مهارة حسب راي المبحوثين، 73% من المبحوثين يعتمدون على المرعى الطبيعي لتغذية حيواناتهم مع تقديم قليل من العلف المركز، وأيضا اختبار مربع كاي أظهر علاقة معنوية بين المشاركة ومعلومات المبحوثين عن التلقيح الاصطناعي، تغذية الحيوانات الحوامل وتغذية الحيوانات المنتجة للبن بينما لم يظهر الاختبار علاقة معنوية بين المشاركة ومعلومات المبحوثين عن صحة الحيوان. هنالك علاقة ارتباط بين المشاركة وخبرة المبحوثين بينما لا يوجد ارتباط بين المشاركة والدخل وحجم القطيع. لا توجد علاقة معنوية بين المشاركة ومهارة تصنيع الجبنة لدى المبحوثين ، تحليل التباين اظهر اثر معنوي لمستوى التعليم على المشاركة بينما الهدف الإنتاجي لم يظهر اى اثر على المشاركة.

خرجت الدراسة ببعض التوصيات منها يجب استخدام المحاضرات وعروض الفيديو كوسائل ارشادية أساسية في قطاع الثروة الحيوانية وكذلك عمل برامج توعية مكثفة عن التلقيح الاصطناعي وضرورة الإعلان المبكر عن الحملات الارشادية المصحوبة بالتدريب لاكساب المهارات وخاصة تصنيع الجبنة.

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CHAPTER ONE

Introduction

1.1 Background:-

Livestock represents a major part of the agriculture sector and an important part of Sudan export. One important part of development is the livestock component managed by pastoralists and considered the backbone of the agricultural production and export (Ahmed, 2014). Extension is out of school system of education in which adults and young people learn by doing. Livestock extension is a special branch of extension education, which deals with the people through educational procedures, for improving livestock farming methods and techniques, increasing the animals and income, stepping up the level of living and elevating the social educational standards of rural life (Mathialagan, 2007).

Due to lack of knowledge and convictions, many livestock producers adopt traditional methods for their livestock, so the transfer of knowledge and skills to them is an important extension activity and the extension agent must prepare himself thoroughly. He must find out which skills or areas of knowledge are lacking among the livestock producers in his area, and then arrange suitable learning experiences through which the livestock producers can acquire them (FAO, 2019) .

An extension campaign is coordinated effort to inform many livestock producers in a relatively short period about livestock topic of widespread or interest, using a variety of communication channels (Boa, Papania etal, 2016). Researches bring out innovation, the extension worker carries this new scientific information and passes it on to livestock producers; hence, an agency required to bridge the gap between the researchers and the people at large is extension workers (Mathialagan, 2007).

1.2 Research problem :

What is the effect of extension campaigns activities on livestock producers' knowledge (regarding animal nutrition and animal health) and skills (regarding cheese making) in South Kordofan State?

1.3 Objectives of the study:

1.3.1 The main objectives:

To determine the effect of extension campaigns activities on livestock producers knowledge and skills.

1.3.2 Sub objectives:

1- To study the relationship between some respondent's socio-economic characteristics (education level, experience, income, herd size and breeding purpose) and the participation of the respondents.
2- To identify the preferred extension methods to the respondents.
3- To identify the factors that influence the participation of respondents on extension campaigns.
4- To reach recommendations that contributing in improving livestock extension work.

1.4 Research hypothesis:

1- There is no statistical significant relationship between the exposures of respondents to extension campaigns and their knowledge and skills regarding animal nutrition and health and cheese processing.
2- There is no statistical significant relationship between participation and some respondent's socio-economic characteristics (educational level, experience, income, herd size and the production purpose).

1.5 Research Question:

The research questions of this study are:

1. What is effect of extension methods used in campaigns on level of respondent's knowledge and skills regarding animal nutrition, animal health and cheese processing?
2. What are the preferred extension methods favored by respondents?

1.6 Importance of the study:-

The importance of this study is to focus on determining the impact of some extension methods and channels used in extension campaigns for livestock producers, to enable them to develop their livestock through increasing their knowledge and skills. In addition, the study will help extension managers to organize successfully extension campaigns programs in livestock extension in South Kordofan State.

1.7 Variables of the study:-

The dependent and independent variables:-

Independent variable	Dependent variable
Personal characteristic of respondents: - Education level - Experience - Income - Herd size - Breeding purpose Campaigns activities : - lectures - video shows - leaflets - posters	Knowledge in : - animal nutrition - animal health Skill in : animal processing (cheese processing) -participation

CHAPTER TWO

Literature Review

Over a period, extension has become highly specialized in nature, with status of discipline and well-developed profession. It has now its own methodology, philosophy, and principles together with systematized body of knowledge (Mathialagan, 2007).

The transfer of research results is equally as important as their development; an essential element for the successful transfer of technology is the existence of an effective extension system to provide technical assistance. The extension services available to rural poor are often limited because of the lack of sufficient and qualified personnel and inadequate knowledge of livestock nutrition, fodder production, use of by- products and potential feed additives (Singh, 2014)

2.1 Livestock Extension:

The livestock extension should aim at empowering livestock producers rather than making them just an agency of training of trainers (TOT). It is necessary for the extension service providers to shift their approach from a fixed TOT to more flexible and sustainable participatory extension to face the challenges in livestock development.

2.1.1 Meaning of extension:-

The word extension is derived from the Latin roots "ex" meaning out and "tension" meaning stretching. Extension education is stretching out to the people, who are beyond the limits of educational institution, (Venkatasubramanian, 2019).

- Extension involves the conscious use of communication of information to help people to form sound opinions and make good decisions (Van den Ban, Hawkins, 1996).

Mathialagan, (2007) reported the following meanings:

- Extension is education for all people farmwomen, youths and villagers as a whole.
- Extension is working with all people irrespective of sex, age to answer their needs and wants.
- Extension is helping people to help themselves, extension makes people self-reliant by bringing about desirable changes in what they feel (attitude), what they know (knowledge) and what they do (skill).
- Extension is developed of individuals, leaders, society as a whole, in day-to- day living.

- Extension is living relationship between the worker and the people. The extension work can be conducted through close and continuous contact between the extension worker and the pastoralist in the area. In proportion to the number of contacts, more and more people are influenced or changed to adopt new method.
- Extension is two-way channel. The extension worker has dual responsibility of bringing the results of research to the livestock producers and at the same time has the responsibility to transmit the problems faced by the livestock producers to the research worker for answers or solution.
- Extension is continuous educational process, in which both the learner and teacher contribute and receive. Farmers should be informed of the latest findings of research for efficient production and it is the job of the extension worker to continuously educate the farmer about the latest scientific information relating to feeding, breeding and management of livestock for increased production.

2.1.2 Concept and definitions of extension:

The basic concept of extension is that it is education; we can define education as shaping of behavior of the individual for adequate adjustment in the society, change in behavior means, change in knowledge and understanding, skill and attitude. Extension education is an applied science consisting of content derived from researchers, accumulated field experiences and relevant principles drawn. Roling (1988), defined extension as a professional communication
Intervention deployed by an institution to induce change in voluntary behavior with a presumed public or collective activity from the behavioral sciences (Mathialagan, 2007).

2.1.3 Veterinary and animal husbandry extension

It 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, approaches and contents but they differ with regard to objectives, strategies, methods, subject matter specialists, clients, applications, situations and services (Sharma, 2008).

Differences between Agricultural extension and Livestock extension:
It is difficult to transfer livestock development technologies for a variety of reasons, which emanate from the differences in crop and animals itself. The livestock owners depend upon the technical persons for adopting technologies/ practices, which include Artificial insemination, pregnancy diagnosis, vaccination, diagnosis, and treatment of animals. This means the livestock owners needs to take the animals to the technical person or the latter have to be brought to the animal for services / adoption of practices. As a sequel, not only

the distance between livestock owner and the technical person but also the attitude and skill of the technical person also come into the picture. If attributes of innovations are taken into consideration, it will be very clear that crop technologies outweigh the livestock technologies in terms of observability of results, simplicity and cultural compatibility (Venkatasubramanian, 2019).

2.1.4 Components of Extension

Mathialagan (2007) stated that extension has three broad components, extension education, extension service and extension work.

1. Extension Education: Here the extension efforts are research based mostly concerned with development of communication media-mix, training-technology, and evolving research. The role of extension education is generally performed by higher learning institutions viz, research institutes, universities and apex level training and extension organizations.
2. Extension Service: It is an organization and / or programme for animal husbandry, agriculture, development and rural welfare, employing the extension process a mean of programme implementation. Extension service has the role and responsibility of bridging the gap between research and users of technology through transplanting; transmitting and translating research results in to practice by way of establishing coordination and linkages with institutions of higher learning on the one hand, and people institutions and organizations, on the other.
3. Extension work: Extension work is to help people to solve their own problems through the application of scientific knowledge as now generally accepted.

2.1.5 Aims of extension:

Extension aims at a human resource development for multiplier effect by imparting knowledge, skills, understanding about the use of various components of technology. It also aims to increasing production, bringing suitable changes in the cultural aspects of the people so that the change in practices automatically bring changes in the knowledge, skills and attitudes. (Mathialagan, 2007).

Venkatasubramanian (2019) stated that extension involves systematic and organized communication with livestock producers with a view to helping them in such a way that the livestock producers:

- Obtain a better insight in to their present and future position as livestock owners;
- Acquire sufficient knowledge and skills necessary to increase production or reduce cost of production;
- Develop positive attitudes of livestock development;
- Able to choose feasible and optimum objectives;

Able to identify problems, look for solutions, solve the problems identified and evaluate the results within the farming system situation in which they are operating. Other elements required for increasing animal production are;

1. Remunerative markets.
2. Assured water and electricity supply.
3. Local availability and accessibility of inputs such as feeds, medicines, vaccines, technical service and equipment
4. Roads, transportation, and storage facilities
5. Credit supply
6. Appropriate policy in animal husbandry

According to Venkatasubramanian (2019) objective of livestock extension education is development of livestock producers by improving their living standards. This could be done by:

- Bringing about desirable changes in the knowledge, attitude and skill.
- Assisting livestock producers to realize their needs and problems.
- Developing rural leadership, mobilizing people and their resources.
- Providing knowledge about recent technologies and their application.

2.1.6 Principles of extension:

Principles means law or settled rules for action. It is a universal truth that has been observed and found to be true under varying condition and circumstances. There is no set of rules, guides, principles that can be passed on to extension workers to follow for rural development, because every situation is different, every potential leader has a different personality, background and attitude that he has acquired through his experiences (Mathialagan, 2007).

Mathialagan (2007) stated the following principles:-

1. Principles of participation**:** Participation of people in all of the activities of extension programme means involvement, cooperation of people in planning the programme, determining objectives, setting up plan of work, carrying on actions and evaluating results. The degree of participation will vary and cannot be predetermined. If people participate in programs, they develop a sense of belonging. This also develops leadership and increases the confidence of the people, this will pave way for the success of the programme and future extension programme will be easily introduced and accepted by the people. Evidence supports that it is beneficial to involve the livestock producers in developing, adopting and evaluating the technologies. Many of the extension programs were not successful due to poor participation of livestock producers. However, it is necessary to understand the differences between transfer of technology and participatory extension.

2. Principles of learning by doing: During the extension programme, the people should be encouraged to learn new practices by doing them. It is learning by doing, which is most effective in changing people's behavior and in developing the confidence to use the innovation in future.
3. Principles of leadership: Local leaders are the guardians of local thought and action. So, for introducing any new practice the extension worker should identify, select and train the local leaders. Extension service development and expansion depends directly upon the degree of involvement of local leaders.

2.1.7 Leadership in livestock extension:

Leadership is the process of influencing people to direct their efforts towards the attainment of particular goal(s). The success of a leader depends upon his ability to work with people and to get things done through people. This involves the use of effective communication skills. To be effective, the leader must have the ability to convey meanings to his people. Leaders must be both efficient and effective. Efficiency is the ability to do things right whereas effectiveness is the ability to do the right things. When leaders deal with efficiency they generally communicate in terms of objectives such as cost, productivity and worker turn over. When they deal with effectiveness, they often communicate in terms of demand, growth rate, return on investment and other criteria that can be used in comparing the agencies performance with that of the expected targets to be achieved. Successful leaders are interested in both efficiency and effectiveness (Venkatasubramanian, 2019).

Working with Local Leader:

The extension agent should ensure that the trained persons are actually used for augmenting extension work. For this purpose there should be regular follow up by the extension worker by way of frequent contacts in person as well as by correspondence with the trained-leader. Local leaders are not only to adopt improved practices in their own farm and home but also they should consciously try to influence others to adopt the practices.

The extension worker's own relationship with local leaders will be more important and he should always try to be available to support and encourage their work (Venkatasubramanian, 2019). He added stated that there are four main aspects of working with local leaders, which the agent should keep in mind.

a) Inform the local leader (s) about his extension activities.
b) Visit the places of extension work.
c) Train the local leader, as they need.
d) Encourage them to adopt new practices.

2.1.8 Sources of information on animal husbandry:

There are several sources, which can be tapped to get the information on animal husbandry. These sources include State Department of Animals Husbandry. Veterinary Colleges, Animal science institutes, Livestock research stations, farms, milk federation, unions Training organization, Biological production units (semen, vaccines. etc.). Pharmaceutical companies, Veterinary medical shopkeepers, Veterinary medical representatives, progressive livestock keepers, Non-government organizations (Venkatasubramanian, 2019).

The domain of knowledge covered by extension worker are:

- Technical problems such as selection of livestock, improved breeding, better feeding, housing and management.
- Farm economics and organizational problems which include importance of culling of animals, labor management, labor saving equipment (milking machine, meat processing equipment) acquisition of credit and its repayment, farm plans. How to reduce cost of production of milk, meat or eggs.

2.1.9 Communication:

The word originated from the Latin word "communis" which means common. Leagans defined communication as a process by which two or more people exchange ideas, facts, feelings or impression in such ways that each gains a common understanding of the meaning and use of messages.

Through communication, an individual shares his idea, information and knowledge with others. A good communication depends upon the communicator's ability to organize the message with proper treatment in suitable channel keeping in view the receivers type, cognitive ability and experience.

2.1.9.1 Elements of communication

According to (Venkatasubramanian, 2019) there are six important elements involved in the communication process

1. Communicator: is the person from whom the message originates.
2. Message: is the information or the meaning the communicator wants to convey.
3. Channel: is the media through which the communicator sends his message.
4. Audience: is the receiver of the message.
5. Feedback: give the details about audience response to the given communication process.
6. Effect or impact: The change has taken place with the receiver due to the communication.

2.1.9.2 Barriers to effective communication

Venkatasubramanian (2019) reported that some of the common problems, which come in the way of effective communication, are:

- Lack of planning
- Unclarified assumption of the sender
- Semantic distortion
- Badly expressed message
- Loss by transmission
- Poor listening
- Fear, distrust and threat
- Insufficient adjustment period to change
- Biasness of the communicator.

2.1.10 Extension and Development Programs:

Development means development of men, the satisfaction of their basic needs – food, shelter, clothing and access to safe drinking water, sanitation, public transport, health and educational facilities. Under development means denial of basic needs to the people while enhancing the material returns to the dominant groups. Development will necessarily involve the use of physical, financial and human resources. The use of resources will depend on who controls the available resources and how decisions are made affecting their use.

2.1.10.1 Human (Personal) Development:

Development in any meaningful sense must begin with and within the individuals. Unless motivation comes from within, efforts to promote, change will not be sustainable by the individual. The individual will remain under the power of others. It is a process by which an individual develops self-respect and becomes more self-confident, self-reliant, cooperative and tolerant of others through becoming aware of his/her shortcomings as well as his/her potential for positive change

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2.1.10.2 Livestock Extension and Development Programs:

The efforts of Animal Husbandry Extension dates back to 1952, when the Key Village Scheme was introduced in the country to improve the breeding and health of the animals. Later, a number of schemes or projects have been introduced to transfer the technologies and thereby increase the production of livestock (Venkatasubramanian, 2019).

2.2 Extension methods

Al-Subaiee (2007) reported that extension methods play significant role in achieving extension program goals. Therefore, extension agents are concerned about selecting the most appropriate extension methods based on type and objectives of extension programs, farmers characteristics, and preference.

Extension teaching methods are the devices used to create situations in which communication can take place between the instructor and the learner, also extension methods are define as plans used by the extension workers to communicate their ideas to the clients (Mathialagan, 2007).

2.2.1 Classification of extension methods:-

Mathialagan (2007) stated that extension methods are classified according to use, form and function.

1. Classification according to use:-

1. Individual teaching methods: defined as the direct contact by the extension worker with an individual for a specific purpose
   This class include farm and home visit, telephone calls, personal letters, result demonstration and office call.
2. Group teaching methods: include method demonstration, group discussion, meeting, training, tours, result demonstration, drama and puppetry, video lesson and computer multimedia, campaigns.
3. Mass contact: involve printed materials, radio programs, TV. Programme, exhibition, film shows, circular letter, e-mail, video text.

2. Classification according to form:-

1. Written method: Like printed materials, personal letters, circular letters.
2. Spoken method: meeting, farm and home visits, office calls, radio talk, Tom-tom
3. Visuals method: result demonstration, exhibition, TV telecast, meetings with AV aids, film shows, drama and puppetry, video text, internet.

3. Classification according to function:-

1- Telling: include lecture, meetings, audio lessons, farm and home visit, radio talk, extension talk.
2- Showing: motion picture, exhibition tours demonstration, internet and video text.
3- Doing: include practical, workshop, method result demonstration, do it yourself.

2.2.1.1 Group teaching method:-

A group is a body of individuals drawn to gather around a common interest. Such a group discussion is utilized to promote an objective group reaching collective decisions, through cooperative methods are:

- Method demonstration
- Field trip
- Meeting

1. Method demonstration:

It is relatively a short time demonstration given before a group to show how to carry out an entirely new practice or old practice in better way. The method demonstration is given by the extension worker himself or by a trainer leader for teaching a skill to a group.

Advantages:

- It is very effective in teaching new skill.
- It stimulates action.
- Builds confidence
- It introduces a change of practice at low cost.

Limitation:

- Suited only to the skill involving technologies.
- Transporting the materials and equipment to the demonstration plot is difficult.
- It causes a setback if whole programme is improperly coordinated.

2. Field trips and tours:

A group of interested farmers, accompanied and guided by extension worker goes on tour to see and gain firsthand knowledge of improved practices in their natural setting. This visit may be to the research farm, demonstration plots, and institution.

Advantages:

- Participation gain firsthand knowledge of improved practices and are stimulated to action.
- Adoption percentage is high.
- Caters to group psychology and leadership.
- Widens the vision of the participants.
  It has the entertainment and site seeing values.
- Develop better personal relationship between the participants and extension worker.

Limitation:

- Most expensive method.
- It involves time, transport and other number of preparations.
- It is difficult to fix up season and time suitable for all.
- Frustration may result if the tour is badly conducted.
- There is risk of accident.

3. Meeting:

Meeting includes all kinds of meetings held by extension worker. In size, the meeting varies from small committee meeting to large. Five general types of meetings involved in extension work, organization, planning, training, community and special interest meetings.

Other classification of meeting is the general meeting, lecture, group discussion, workshop and seminar.

Advantages:

- Large number of people can be reached.
- Serves as a preparatory stage for other methods.
- Group psychology can be used in promoting the programme.
- Reaction of the people to programme can be assessed.
- Adoption of practices can be accomplished at low cost.

Limitation:

- Meeting place and facilities are not always adequate.
- Scope for discussion is limited except possibly for few questions and answers.
- Handling the topic becomes difficult because of mixed composition of audience.

4. Lecture:

Lecture is the most commonly used method. It is the best method for presenting information to large number of persons in short time.

Advantages:

- The range of subjects that can be covered by this method is unlimited.
- Large group communication.
- Cover a large quantity of information in a given time.

Limitation:

- Not effective for skill teaching.
- It is weakness is that it is a one-way communication method.

5. Extension Campaigns

An extension campaigns is a coordinated efforts to inform many farmers in a relatively short period of time about an agriculture topic of widespread concern or interest. The aim is to a chive quick, large-scale change in behavior and practices through carefully choreographed efforts by different organizations, using a variety of communication channels. To be effective, campaigns need a panoply of partners and people. The most successful campaigns think and act expansively, encourage wide participation, and foucus on topics that matter most to people (Boa, Papania, etal, 2017).

Mathialagan (2007) stated that campaigns is an intensive teaching activity undertaken at an opportune time for a brief period, focusing attention in a concerted manner towards a particular problem, so as to stimulate the widest possible interest. The first step for the campaigns is to analyses the situation, identify the local need and create an awareness of the need for the campaigns. This awareness is given through the meetings.

Planning extension campaign:-

Before planning the campaign the purpose must be made clear, the campaign should fulfil the need of the people, be direct towards the solution of problem the people recognize, deal with a problem important to a majority of the people, and offer a solution that the people can and will accept and focus on one idea at a time.

1. Discuss with local leaders and agencies.
2. Consult the specialists and find solution to the problems.
3. Ensure technical sources and supplies.
4. Select a suitable time for launching the campaign.
5. Give wide publicity about the campaign in advance.
6. Specify the work to each service person and local leaders.

Conducting extension campaign:-

Conduct the campaign with the help of local leaders as per plan. Open campaign by doing something dramatic that focuses attention on the problem. Hold a meeting under the president ship of a popular respectable personality and incite everyone interested.

After the inauguration keep the attention of the people focused in the recommended practice continuously, apply all creativity and device unusual and interesting approaches. Set a definite time to end the camping. Feature the final day so the people can share the satisfaction of completing the project. Invite an important person. Report results to the people. Recognize community leaders for their work.

Evaluate the results- review the objective and if necessary reconsider it, watch the campaign closely from the beginning to end.

Advantages of extension campaigns:-

1. Especially suited to stimulate mass- scale adoption of an improved practice in the shortest time possible.
2. Campaign exploits the group psychology for introduction of new practices.
3. Successful campaign create conducive atmosphere for popularizing other methods.
4. Builds up community confidence.
5. Best method for the technologies, which need the entire community's adoption.

Limitation:-

1- Not suited to individual problems.
2- Campaign would be successful only when all participants cooperate in it.
3- Not suitable to the complicated technologies.
4- Requires adequate preparation, and close association of technical agencies and propaganda technique.

2.2.1.2 Mass Media:

Printed media:

Print media is one of the oldest and basic forms of communication. The contribution of print media in providing information and transfer of knowledge is remarkable. Even after the advent of electronic media, the print media has not lost its charm or relevance (Perry, 2018).

Printed media in extension work include, leaflet, folder, pamphlet, bulletin, booklet news report, wall newspapers and circular letter.

To apply this method effectively the educational levels and literacy rate of the audience must be considered. Further, the written communication reduces the loss of information during transit and in addition, it covers large number of people within a short time. Extension programme can take abroad and creative approach to ways in which to use print medium for conveying news to audience. (Mathialagan, 2007).

1. Leaflet:

It is a single sheet of paper used to present information on only one topic in a concise manner and simple language. To preparing leaflet, select a suitable topic based on livestock producers need, there should be only one idea, collect all relevant point and only the most essential one, use short, simple and familiar words, include relevant pictures.

Advantages:

- Reaches a large number of literate pastoralist.
- Preserved and used for future reference.
- Comparatively cheap.
- Provides accurate information.
- Easy to make.
- Promotes literacy.

Limitation:

- Less useful in low literacy area.
- Cannot used in exclusion of other methods.
- Will lose its significance if not carefully prepared and used.

2. Folder:

Folder is a single piece of paper folded ones or twice. When it is open the material presented are in sequence.

To prepare folder, after deciding topic based on the pastoralist need, collect the relevant points. Arrange the facts in logical order. Select the important points. The idea and sub ideas can be listed one below the other. The title printing should be attractive.

Folder need not be complete, as it complements the other methods.

3. Pamphlet:

A pamphlet consists of 3 to 12 pages and deals with a specific topic in a detailed manner

4. Bulletin:

A bulletin written piece of information about a number of related topics presented in a detailed way. The number of pages for a bulletin ranges from 12 to 2

5.Booklet:

When the number of pages exceeds 20 then it is called a booklet. Usually a booklet deals with number of topics and the discussions are carried out more elaborately with illustrations, pictures, figures and tables.

6. Circulars:

Letters are sent to a group of people by passing it out from one man to other to pass on certain information or messages. Circular letters help to maintain a continuous contact with farmers.

7. Newspaper/ Newsletter/ Magazine/ Journal: Periodicals give a wide range of information about what is going on in the next door and around. It is mass media which can be of immense use in message dissemination. It helps to serve as a forum for extension activity in an area. It plays the role of communicating the information to people of various levels and acquaint the public with programs, activities and progress made in an area.

2.3 Audio – Visual Aids

An aid is an instructional device that assists the facilitators to teach the learners effectively and help them to learn with greater understanding.

Research and experience have shown that audio visual aids can significantly capture audience attention create and sustain interest, highlight the main points, make understanding easy increase learning and enhance the process of transfer of technology.

The audio – visual aids classified as audio aids, visual aids and audio visual aids.

2.3.1 Audio aids:

An audio aid is many instructional device through which message can be hear but not seen. It include public address system, radio, tape recorder and player, telephone, gramophone records.

1. Public address system: Consist of microphone (mike), amplifier and loudspeaker. It used to amplify and reinforce sound.
2. Radio: Radio is the most vital source of dissemination of animal husbandry and agricultural information

Advantages:

Fast medium, cheap, realism and authenticity, emotional impact, suitable to the illiterate.

Limitation:

- Programme only for ears, so needs full attention.
- One-way communication.
- As the broadcasts are one-time event, chance of missing the programme.

2.3.2 Visual aids:

A visual aid is an instructional device through which a message can be seen but not heard. It classified into projected visual aids and non-projected visual aids.

Projected visual aids:

Any visual aids which is used for magnification of image on a screen in dark or semi-dark condition can be called projected visual aid, it include film projector, overhead projector, slide projector, director projector, computer.

The importance of projected visual aids is the powerful illumination draws full attention of the audience. The projected visual aids developed and produced by specialists and convey exact meaning to the audience. It saves the time of the teacher and the learner. It is flexible in nature to meet the requirements of small and large groups by enlarging the projection on the screen.

Non-projected visual aids:

It include chalk board, flannel board, bulletin, magnetic board, poster, chart, flash cards, photographs, picture, exhibits and displays.

Posters:

A poster is design to make a public announcement of a special idea, and timely information.

It usually includes only a few words with an illustration to catch the attention of the viewers and to pass a simple message at glance. It should be attractive, brief and clear. Caption should be as small as possible, having not more than five words. Never write the caption vertically. The words selected should be in

slogan form, and printed in plain and bolder letters.Picture should be bold and bring out the message clearly. It should be prepared based on the audience experience and objects familiar to them should be use. Bright attractive colors use to print picture and words. Highlight the main prominent message with a more color. Size must be large enough to be easily seen. Place posters where people pass or gather.

Chart:

Chart is a visual symbol summarizing, comparing, contrasting, or performing other helpful services in explaining subject matter. Chart should be with bold and simple lettering, brief words, simple design, colorful and large enough to be seen.There are many types of chart, Flip chart, Tabular chart, Flow chart, Overlay chart, Pull chart, Strip teaser chart, Tree chart.

Flip chart:

Flips carry a series of ideas arranged sequentially. Individually charts are tagged or bound to some support. During teaching, these flips are turned one by one in sequence.

2.3.3 Audio-visual aids:

Audio-visual aid is an instructional device through which a message can be hear as well as seen. It include movie projector, television, video player, LCD panel, multimedia computers.

Movie projector:

It is an audio-visual aid through which motion pictures are projected. The motion picture film divided in to tow parts, the picture track and sound track.

Television:

The word television comes from a Greek word meaning “far” and a Latin word meaning ‘to see’. Hence, it is ‘to see what is far’. Television used for mass teaching, it is more personal than radio, now a days it is widely used as an important audio-visual aid. Alive transmission of an event is possible only through this medium with its unique potential to communicate to the two most important sense organs, simultaneously to an exceedingly large number of audience.

Advantages:

It attracts attention, increases interest, develops desire, creates conviction, promotes action and builds up satisfaction.

T.V, video, film and plays can achieve a mixed goal of providing information in an entertaining way.

Limitation:

- Intense competition with entertainment.
- Expensive.
- If editing is not done properly, programme become ambiguous.
- It requires certain showmanship.
- It cannot be used where there is no electricity.
- The entertainment aspects will dominate and the information content may be missed.

Video:

Video is used to denote pictures which have been converted into electronic signals. Video lessons produced can also be used for teaching of small group of farmers with the help of video projector.

Advantages:

- Immediately attract the attention of the learners.
- Will be useful when the presentation has to be repeated at many places.
- It provides an interactive and consistent instructional format.
- It improve the teaching quality.
- Deletion, addition and updating the lesson and the content can be made instantaneously.

  Disadvantages involves much cost, time and technical skill in production (Mathialagan, 2007).

Mass media such as (Radio and T.V) when compared with other extension methods they have low effect on behavioral change of the respondent, they never received any agricultural information from this media (Abdullah, 2016).

2.4 Innovation Decision and Adoption:

Livestock production is an important part of farming; people are depend upon it for supplies of food. The production of livestock involves selection, breeding, feeding, care, and marketing.

Success in raising livestock depends on many factors; producers must have knowledge, skill and patience. They must use the results of research by animal scientists, (James and Frank, 2009).

Innovation and its adoption by the livestock farmers is considered as essential to enhance the production of livestock to meet the demand for the products both internal and external. The current extension approach should focus on innovation rather than technology. It does not mean that technology is not required. The technology needs to be brought in at an appropriate time, which is ripe for its introduction. Innovation does not mean it should come only from

researchers or extension personnel. It can emanate from any source including the farmers.

The extension approach is to help the owners to take appropriate decisions rather than taking decisions for them. Livestock farmer being the owner of the animals must take various decisions in day to day management of his stock. There are several socio- economic and technological issues on which the livestock producers have to take appropriate decisions. Hence, it is the responsibility of the livestock extension personnel to train the livestock farmers in taking proper decisions. The quality of the decisions taken depends upon the quality and reliability of the information that is being used by the livestock farmers. However, the information needs vary from one livestock farmer to the other. The idea is to empower the livestock farmer to solve his problems by taking appropriate decisions. Knowledge is rightly consider as a key to empowerment and extension agencies may do well in improving the knowledge of the livestock producers. (Venkatasubramanian, 2019).

2.5 The previous studies:

The previous studies about extension methods in livestock sector are extremely limited especially in south kordofan state. Study by Abdallah (2016) about veterinary extension methods used in livestock sector in south kordofan state. The result in this study reveals:

- Decrease in educational level among the livestock producers, increase in literacy level, so the ratio of respondents who did not use leaflets and posters is very high 97%.
- In addition, the study showed that there was a high ratio of respondents stated that, the radio was the preferred extension method for them as a source of knowledge.

Another study by Osman (2009) in agricultural extension about (the effect of extension campaigns on adoption of wheat crop technologies at zeidab agricultural scheme. The study showed that extension campaigns are helpful in delivering the modern technologies to farmer; however, it will require greater accuracy in programme design.

CHAPTER THREE

Research Methodology

3.1 Research area:

South Kordofan State is a part of the greater kordofan region of Sudan, It shares borders with Darfur to the west, North kordofan state to the north, White Nile state to the east and the Republic of South Sudan to the south. It has an area of (158,355 Km2) and an estimated population of approximately (1.111,859) according to 2006 estimation (Sudantribune,2019). There are 17 localities in South Kordofan State. The most important ones are kadogli, Elrief Elshargi, Dallanj, Elgooz, Rashad, Abu jubaiyha and Talodi. Kadogli is the capital of the state; it has a hot semi-arid climate. Economy: it is a trading center for gum Arabic and livestock (Wikipedia,2019). The economic activity represented in agriculture, livestock and mining. Livestock population in the state is about (8,456,613) animal unite (Ministry of Animal Resource South Kordofan State, 2018).

Table (3.1) Information about Kadogli and El reef El shargi locality

Locality	Area	Population	Capital
Kadogli	8600 km2	163724	Kadogli
El reef El shargi	4577 km2	57586	El quick

Source: Ministry of Animal Resource South Kordofan State 2018

Table (3.2) Livestock size in kadogli locality

Animal type	Cattle	Sheep	goat	Camel
Number	78.716	13.425	19.220	0

Source: Ministry of Animal Resource South Kordofan State 2018

Table (3.3) Livestock size in El reef El shargi locality

Animal type	Cattle	Sheep & goat	Camel
Number	416,300	405,836	500

Source: Ministry of Animal Resource South Kordofan State 2018

3.2 Research population:

The target population of this study were livestock producers that settled in both kadogli and Elrief Elshargi localities - South Kordofan State.

Socio-economic characteristics of research population:

There is a big variation in tribe structural in south kordofan state, whereby Nubba and Arab tribe are coexist alongside. These tribes practice the profession of grazing and farming, they have common socio-economic characteristics in habits and traditions. The most predominant pastoral system in South Kordofan State is the traditional system, which is characterized by instability and moving in search of pasture and water. This system is inherited among the generations. The main types of livestock are Cattle, Sheep and Goat. There is no specialization in production purpose, so animals are kept for milk, meat, as a source of income for family, transportation , as protection against risks such as theft, armed robbery , epidemics and a source of social proud for individuals and the tribe. The heard size is big with lack of productivity, the system focuses on expanding numbers, and the ratio of annual withdrawal is very small just to facing the social needs.

3.3 Sample selection procedure:

This study used simple random sampling procedures, one hundred livestock producers were selected randomly based on the similarity and homogeneity in population. Six villages from the two localities chosen based on livestock coexistent; the extension campaigns that implemented in the villages, also these villages are stable on a security level and easily accessible.

Table (3.4) Frequency distribution and percentage of respondents by localities and village

Locality	Villages	Frequency	Percent
Kadogli	Coulba	18	18.0
	Elsarf	19	19.0
	Abusafifa	13	13.0
Elrief Elshargi	Elkewec	29	29.0
	Brno	11	11.0
	Damiec	10	10.0
	Total	100	100.0

Source: field survey 2019

3.4 Data collection:

The study used primary and secondary sources for data collection.
Primary sources: Primary data were collect by using face – to – face questionnaire by researcher.
Secondary sources: Secondary data were obtain from the references, theses, reports, papers and web side.

3.5 Data analysis:

The collected data were analyzed by using computer program SPSS (statistical package of social science) to obtain frequencies, percentage, Chi-square, correlation and ANOVA measurements.

CAPTER FOUR

Results and Discussion

Table (4.1) Frequency distribution and percentage of respondents by gender

Gender	Frequency	Percent
Male	98	98.0
Female	2	2.0
Total	100	100.0

Source: field survey 2019

From the above table (98%) of the respondents were male while only (2%) were female. But really on the ground the women in the research area had a great role in all aspects of live especially livestock breeding, in terms of feeding and milking of animals, selling milk and dairy products and household tasks, but there is some cultural and social restrictions prevents women to tell information to out siders persons.

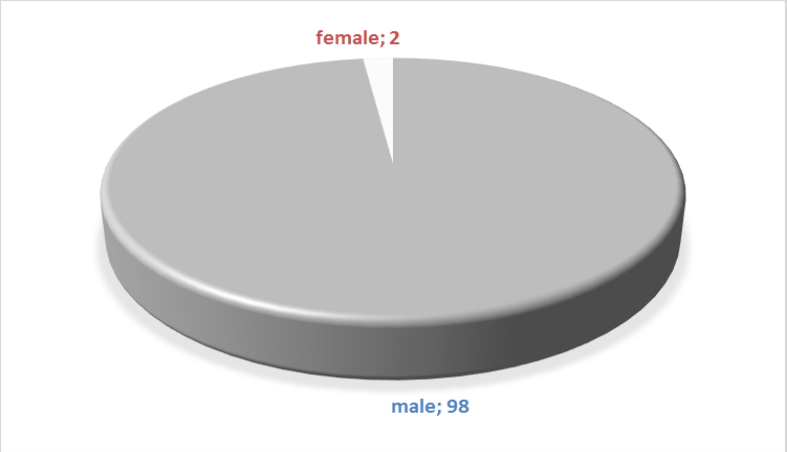

Figure 1 : Distribution of respondents by gender.

Table (4.2) Frequency distribution and percentage of respondents by age group

Age group	Frequency	Percent
less than 30 years	32	32.0
31-40	32	32.0
41 – 50	23	23.0
more than 51	13	13.0
Total	100	100.0

Source: field survey 2019

Table (4.2) shows that (32%) of respondent had an age (less than 30 years), and also (32%) had an age between (31-40) years ,(23%) of respondent fall in the age group ranging between (41 - 50) years while (13%) of respondent had an age (more than 51) years old. The general conclusion indicates that 64% of the whole respondents have an age less than 41 years thus; they were in youth stage so they will have a high ability to acquiring knowledge and skills.

Table (4.3) Frequency distribution and percentage of respondents by education level

Education level	Frequency	Percent
Illiterate	43	43.0
Primary	35	35.0
Secondary	16	16.0
University	6	6.0
Total	100	100.0

Source: field survey 2019

As shown in the above table (43%) of respondent were illiterate, (35%) received primary education, (16%) received secondary education, while (6%) of respondent were graduate. It is clear the general conclusion indicates that 57% of the whole respondents were educated.

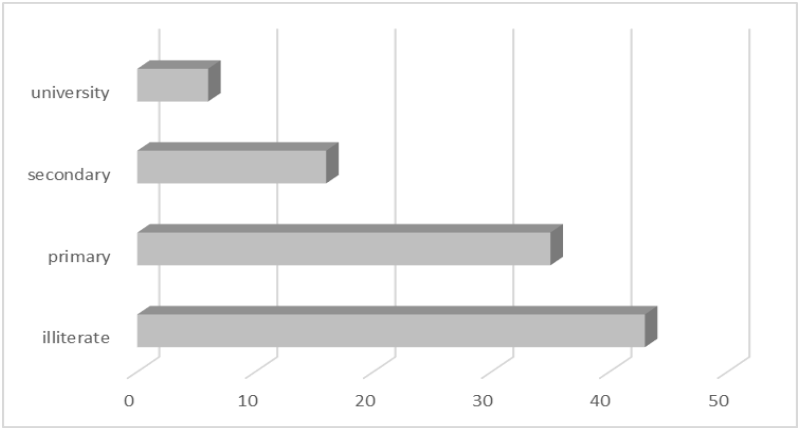

Figure 2: Distribution of respondents by education level

Table (4.4) Frequency distribution and percentage of respondents by their occupation beside animal breeding

Occupation	Frequency	Percent
Farmer	51	51.0
Merchant	15	15.0
employee	9	9.0
Others	1	1.0
Animal breeder	24	24.0
Total	100	100.0

Source: field survey 2019

Table (4.4) shows that (51%) of respondent were farmers, (24%) were animal breeders, (15%) were merchant, (9%) employee, while only (1%) work others jobs such as butcher, This insure that the respondents have different additional occupation most of respondents were farmers. This diversification allows people to have different experiences in different aspects of life.

Table (4.5) Frequency distribution and percentage of respondents by their experience years in animal breeding

Experience years	Frequency	Percent
less than 5 years	4	4.0
5 - 7 years	4	4.0
8 - 10 years	32	32.0
more than 10 years	60	60.0
Total	100	100.0

Source: field survey 2019

From the above table (60%) of respondents have (more than 10 years) experience in animal breeding, (32%) have a range from (8 to 10 years), while (4%) have an experience between (5-7) years, (4%) (Less than 5) years. This insures that there were cumulative experiences share.

Table (4.6) Frequency distribution and percentage of respondents by their income

Income per month	Frequency	Percent
less than 5000	36	36.0
5000 -10000	56	56.0
more than 11000	8	8.0
Total	100	100.0

Source: field survey 2019

Table (4.6) reflects that (56%) of respondents their income fall in range 5000 – 10000 SDG in month (moderate-income level), (36%) have less than 5000 pound (low-income level) while (8%) have income more than 11000 SDG (high-income level).

Table (4.7) Frequency distribution and percentage of respondents by marital status

Marital status	Frequency	Percent
Single	15	15.0
Married	85	85.0
Total	100	100.0

Source: field survey 2019

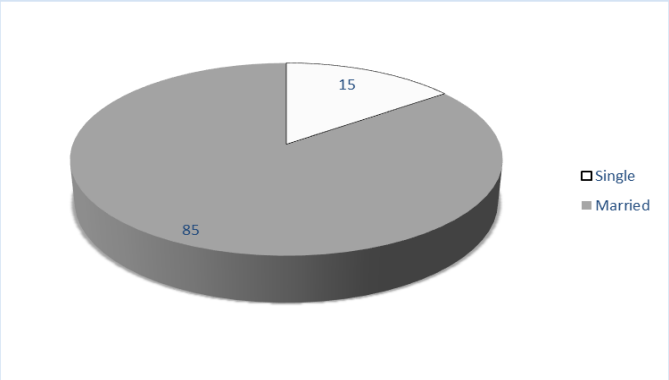

Figure 3: Distribution of respondents by marital status

Table (4.7) shows that (85%) of respondents were married, while only (15%) were single, There is no divorce cases. This indicates that respondents were socially stable, due to the solidarity of rural community members based on local customs and traditional.

Table (4.8) Frequency distribution and percentage of respondents by family size

Family size	Frequency	Percent
2 - 4 member	14	14.0
5 -7 member	17	17.0
more than 8 member	54	54.0
not married	15	15.0
Total	100	100.0

Source: field survey 2019

As shown in table (4.8) (54%) of respondents have family size more than 8 members (big family size), (17%) have from (5 – 7) members (medium family size), (14%) have family size from (2 – 4) members (small family size), while the (15%) were not married.

Table (4.9) Frequency distribution and percentage of respondents by herd type

Herd type	Frequency	Percent
Cattle	20	20.0
cattle + sheep +goat	33	33.0
Sheep	3	3.0
cattle + sheep	7	7.0
Goat	1	1.0
cattle + goat	30	30.0
sheep + goat	6	6.0
Total	100	100.0

Source: field survey 2019

As shown in table 4.9 (33%) of respondents have cattle, sheep, goat as their main type of heard while (1%) of them have goat only. It is clear that the majority of respondents depended on the heard, which consist of several species of animals.

Table (4.10) Frequency distribution and percentage of respondents by herd size

Herd size	Frequency	Percent
less than 100	51	51.0
101 -200	28	28.0
more than 200	21	21.0
Total	100	100.0

Source: field survey 2019

As seen in table 4.10 (51%) of respondent possess herd size less than 100 head, (28%) possess from 101 to 200 head while (21%) of respondent have more than 200 head

Table (4.11) Frequency distribution and percentage of respondents according to breed type

Breed type	Frequency	Percent
Local breed	91	91.0
Cross breed	1	1.0
Local + cross	8	8.0
Total	100	100.0

Source: field survey 2019

Table 4.11 shows that (91%) of respondents have local breed, (8%) have local and cross breed while only (1%) of respondents had cross breed. This indicate that the local breed is dominated to the cross breed in the study area.

Table (4.12) Frequency distribution and percentage of respondents according to the purpose of animal breeding

Production purpose	Frequency	Percent
Milk production	15	15.0
Meat production	5	5.0
Milk + Meat production	80	80.0
Total	100	100.0

Source: field survey 2019.

Table 4.12 demonstrated that (80%) of respondents breeding animals for milk and meat production while (15%), (5%) for milk, meat production respectively. Most of respondents breed animals for binary purpose production,

Table (4.13) Frequency distribution and percentage of respondents by feeding system

Feeding system	Frequency	Percent
Grazing on pasture	27	27.0
Grazing plus Concentrate	73	73.0
Total	100	100.0

Source: field survey 2019

From the table 4.13 above (73%) of respondents reported that they feed their animals on natural pasture and concentrates, while (27%) pointed that they feed their animals on natural pasture only. This indicated that most of respondents know well the importance of concentrates in animal nutrition.

Table (4.14) Frequency distribution and percentage of respondents according to their participation in extension campaigns

Participation	Frequency	Percent
Non participants	67	67.0
Rarely	14	14.0
Some times	9	9.0
Always	10	10.0
Total	100	100.0

Source: field survey 2019

In table 4.14 above (67%) of respondents out of the total respondents were not participated in extension campaigns implemented in their locations, where (33%) participates in different ratio: (14%) participate rarely, (10%) always while (9%) participate some times. This indicates low rates of the participation among the respondents. This mean that there is need to implement more extension campaigns.

Table (4.15) Frequency distribution and percentage of non-participant respondents according to the reasons that prevented them from participating in extension campaigns

Reasons prevent to participate	Frequency	Percent
Not present	31	31.0
Busy	10	10.0
Extension campaigns was not implemented	26	26.0
Total	100	100.0

Source: field survey 2019

Table 4.15 shows that (46.3%) of respondents said that they were not present in the village at the time of implemented campaign, (38.8%) were said extension campaigns not implemented in their locations while (14.9%) of respondents said they were busy.

Table (4.16) Frequency distribution and percentage of non-participants respondents according to the source of obtaining extension knowledge

Source of obtaining knowledge	Frequency	Percent
Self-experience	39	39.0
Neighbors+ friend	5	5.0
Radio	1	1.0
Neighbors + Friend+ Radio	1	1.0
Self-experience +Radio	7	7.0
Self experience + Neighbors+ friend	14	14.0
Total	100	100.0

Source: field survey 2019

From the above table (39%) of non-participants respondents depended on their self-experience, only (1%) depended on radio and (1%) depended on neighbors plus friends plus radio. This mean that although there were many sources for obtaining knowledge, most of respondents depended on their self-experience

Table (4.17) Frequency distribution and percentage of participated respondents according to their opinions about extension means and methods used in campaigns

Extension means and methods	Not effective		moderate effective		highly effective	
	F	%	F	%	F	%
Extension lectures			9	27.3	24	72.3
Extension leaflets	6	18.2	18	54.5	9	27.3
Extension posters	12	36.4	18	54.5	3	9.1
Video shows			3	9.1	30	90.9

Source: field survey 2019

Table 4.17 shows that (72.7%) of participated respondents reported that lectures were highly effective, while only (27.3%) stated that lectures were moderately effective. To evaluate leaflets efficiency (54.5%) of participated respondents stated that it has moderate effect, (27.3%) said highly effective, (18.2%) said leaflets not effective. (54.5%), (9.1%) of participated respondents explained that posters has moderate, highly efficiency respectively while (36.4%) said posters were not effective. (90.9%) of participated respondents reported that video show has highly efficiency, while (9.1%) said it has moderate effective.

Table (4.18) Frequency distribution and percentage of participated respondents by benefit degree from extension campaigns to acquiring knowledge

Benefit degree of knowledge	Frequency	Percent
Nothing	1	3.0
Weak	2	6.1
Moderate	8	24.2
Good	22	66.7
Total	33	100.0

Source: field survey 2019

Table 4.18 show that (66.7%) of respondents who participated in extension campaigns acquired knowledge with good level, (24.2%) with moderate level, (6.1%) weak, while (3%) nothing

Table (4.19) Frequency distribution and percentage of participated respondents by benefit degree from extension campaigns to acquiring skills

Benefit degree of Skills	Frequency	Percent
Nothing	22	66.6
Weak	3	9.1
Moderate	2	6.1
Good	6	18.2
Total	33	100.0

Source: field survey 2019

As shown in above table (66.6%) of respondents who participated in extension campaigns did not acquire any skill, (18.2%) acquired skill with good level, (9.1%) weak level while (6.1%) with moderate level.

Table (4.20) Frequency distribution and percentage of participated respondents by evaluation of campaign preparation

Evaluation of preparation	Frequency	Percent
Bad	2	6.1
Moderate	18	54.5
Good	13	39.4
Total	33	100.0

Source: field survey 2019

From table 4.20, (54.5%) of participated respondents stated that campaign preparation was in moderate degree, (39.4%) said good degree, while (6.1%) pointed that extension campaign preparation was in bad level

Table (4.21) Frequency distribution and percentage of respondents by use of lick stone

Use of lick stone	Frequency	Percent
Not at all	20	20.0
Rarely	40	40.0
Some times	27	27.0
Always	13	13.0
Total	33	100.0

Source: field survey 2019

In table 4.26, (40%) of respondents reported that they did not use salt lick at all time while (27%), (20%), (13%) use lick stone some times, rarely and always respectively. This insure needs of intensive awareness about lick stone.

Table (4.22) Frequency distribution and percentage of respondents according to their different knowledge about some animal husbandry practices and health care

Types of knowledge	Degree of knowledge					
	Do not know		To some extent		Full information	
	F	%	F	%	F	%
Pregnant animal feeding	31	31.1	32	32.1	37	37.0
Lactated animal feeding	25	25.0	29	29.0	46	46.0
Sings of unhealthy animal	0	0	4	4.0	96	96.0
Brucella transfer	42	42.0	15	15.0	43	43.0
Rabbis transfer	1	1.0	6	6.0	93	93.0
BQ prevention	12	12.0	16	16.0	72	72.0
FMD prevention	7	7.0	19	19.0	74	74.o
HC prevention	12	12.0	16	16.0	72	72.0
Vaccination importance	3	3.0	18	18.0	79	79.0
Artificial insemination importance	63	63.0	23	23.0	14	14.0

Source: field survey January 2019

Table 4.22 demonstrated that (37%) of respondents have full knowledge about pregnant animals feeding, (32.1%) to some extent have some knowledge, while (31.1%) have no knowledge about pregnant animals feeding. For the lactated animals feeding (46%) of respondents possess full knowledge, (29%) to

some extent have some knowledge, while (25%) of respondents reported that they have no knowledge about lactated animals feeding. Regarding signs of unhealthy animals table 4.22 shows that (96%) of respondent have full knowledge about signs of unhealthy animals in the heard, while only (4%) to some extent have some knowledge. This means that there is a high awareness about animal health among the respondents. To know the degree of knowledge about brucella transfer 43% of respondents reported that they have full knowledge about brucella transmission from animals to human, 42% said they do not know anything about brucella transfer, while 15% of respondents have to some extent knowledge. However, about the rabbis transfer (93%) of respondents have full knowledge about rabbis transmission, (6%) to some extent have some knowledge, while only (1%) have not knowledge about rabbis transfer. This means that there was a high degree of awareness and knowledge about rabbis' transmission among respondents. Regarding epidemic diseases namely: Black Quarter (BQ), Foot and Mouth Disease (FMD) and Hemorrhagic Septicemia (HS) (72%), (74%), (72%) of respondents have full knowledge about how to prevent animals from BQ, FMD and HS respectively, (12%), (19%) and (16%) to some extent possess some knowledge about prevent of BQ, FMD and HS respectively, while (12%), (7%), (12%) of respondents have no knowledge about prevention from BQ, FMD and HS diseases. In addition, table 4.22 reflect that the majority of the respondents (79%) have full knowledge about the importance of animals vaccination, (18%) to some extent have some knowledge, while only (3%) have no knowledge. About the A.I importance (63%) of respondents have no knowledge, (23%) to some extent possess knowledge, while only (14%) of respondents have full knowledge. This indicates that there is a lack of knowledge about A.I among the respondent.

Table (4.23) Frequency distribution and percentage of respondents according to processing excess milk to other dairy products beside (ROAB, local fermented milk)

Excess milk processed to	Frequency	Percent
Chee	28	28.0
White cheese	16	16.0
Chee + white cheese	36	36.0
Not processed	20	20.0
Total	100	100.0

Source: field survey 2019

As shown in table 4.35 (80%) from the whole number of respondents were processed excess milk to other dairy products, but only (20%) not processes.

Table (4.24) Frequency distribution and percentage of respondents according to their skill in cheese making

Cheese making skill	Frequency	Percent
Don't have	82	82.0
I have inadequate skill	7	7.0
I have adequate skill	11	11.0
Total	100	100.0

Source: field survey 2019

In table 4.24 (82%) of respondents answered they do not have cheese making skill, (11%) have adequate skill, while (7%) have inadequate skill in cheese making. It is clear that there is a high shortage of processing skill among the respondents.

Table (4.25) Frequency distribution and percentage of respondent according to their suggestions to improve extension campaigns

No	Suggestions	Frequency	Percent
1	Implement regular extensions and vaccinations campaigns	41	41.0
2	Early advertising about extension campaigns	27	27.0
3	Increase awareness lectures to change the local breed by focused on A.I technology	24	24.0
4	Increase awareness lectures and training in animal nutrition	23	23.0
5	Increase awareness lectures and training in animal health	21	21.0
6	Training the livestock producers on cheese processing	17	17.0
7	Continuous training to the herders in the all area of livestock for acquire skills	10	10.0
8	Use video show	8	8.0
9	Increase numbers of extension workers in every locality	7	7.0
10	Provide education to the pastoralist	4	4.0
11	Use leaflets in extension campaigns	3	3.0

Source: field survey 2019.

Table 4.25 shows the suggestions of respondents were listed in top- down order. (41%) of the respondents reported that they need extension and vaccination campaigns to gather in regular way, this means that providing drugs and vaccines during extension campaigns will enhance the effectiveness and success of the campaign, while (27%) of the respondents stated that advertising about extension campaigns must be in early time, this means that early advertising will increase the number of participators in extension campaigns. (24%) of the respondents stated that they need intensive lectures on Artificial Insemination Technology (A.I) , this refers to that there is a shortage of information about A.I, in addition to the respondents have an ability to apply this new technology and change the local breed. (23%), (21%) of respondents need lectures and training in animal nutrition, animal health respectively. (8%) of respondents stated that video show is necessary to acquire knowledge. only (3%) 0f respondents proposed that leaflets must be use in extension campaigns and may be referenced where necessary.

Chi- square test

Table (4.26) Chi- square test for the association between participation of the respondents and their knowledge about pregnant animals feeding

Degree of participation	Knowledge about pregnant animals feeding		
	Do not know	To some extent	Full knowledge
Non-participants	29	22	16
Rarely	2	4	8
Some time	0	3	6
Always	0	3	7
P value = 20.232	df = 6	Sig = 0.003	

Table 4.26 reflect that there is significant relationship between participation of the respondents and their knowledge about pregnant animals feeding, this insure that the participation in campaigns contribute in acquiring knowledge.

Table (4.27) Chi- square test for the association between participation of the respondents and their knowledge about lactating animals feeding

Degree of participation	Knowledge about lactated animals feeding		
	Do not know	To some extent	Full knowledge
Non-participants	21	23	23
Rarely	4	3	7
Some time	0	1	8
Always	0	2	8
P value = 16.250	df = 6	Sig = 0.012	

Table 4.27 show that there is a significant relationship between participation of the respondent and their knowledge about lactating animals feeding,

Table (4.28) Chi- square test for the association between participation of the respondents and the use of lick stone

Degree of participation	Use of lick stone			
	Not at all	Rarely	Some times	All ways
Non-participants	30	13	19	5
Rarely	3	3	5	3
Some time	2	2	3	2
Always	5	2	0	3
P value = 11.029	df = 9		Sig = 0.274	

Table 4.28 show that there is no significant relationship between participation of the respondents and the use of salt lick. This may be due to the high cost of the salt lick and it is not available at all time.

Table (4.29) Chi- square test for the association between participation of the respondents and their knowledge about signs of unhealthy animals

Degree of participation	Knowledge about unhealthy animals		
	Do not know	To some extent	Full knowledge
Non-participants	0	4	63
Rarely	0	0	14
Some time	0	0	9
Always	0	0	10
P value = 2.052	df = 3	Sig = 0.562	

Table (4.30) Chi- square test for the association between participation of the respondents and their knowledge about brucella transfer

Degree of participation	Knowledge about brucella transfer		
	Do not know	To some extent	Full knowledge
Not participate	35	8	24
Rarely	5	3	6
Some time	1	2	6
Always	1	2	7
P value = 11.241	df = 6	Sig = 0.081	

Table (4.31) Chi- square test for the association between participation of the respondents and their knowledge about BQ prevention

Degree of participation	Knowledge about BQ prevention		
	Do not know	To some extent	Full knowledge
Not participate	12	12	43
Rarely	0	3	11
Some time	0	0	9
Always	0	1	9
P value = 10.069	df = 6	Sig = 0.122	

Table (4.32) Chi- square test for the association between participation of the respondents and their knowledge about FMD prevention

Degree of participation	Knowledge about FMD prevention		
	Do not know	To some extent	Full knowledge
Not participate	7	13	47
Rarely	0	4	10
Some time	0	1	8
Always	0	1	9
P value = 5.612	df = 6	Sig = 0.468	

Table (4.33) Chi- square test for the association between participation of the respondents and their knowledge about HS prevention

Degree of participation	Knowledge about HC prevention		
	Do not know	To some extent	Full knowledge
Not participate	12	12	43
Rarely	0	3	11
Some time	0	0	9
Always	0	1	9
P value = 10.069	df = 6	Sig = 0.122	

As shown in tables (4.29), (4.30), (4.31), (4.32), (4.33) the Chi- square test of association between respondents participation and their knowledge about [signs of unhealthy animals, transfer of brucella, prevention of BQ, FMD and HS)] revealed that there was no significant relationship (a = 0.05) between the above mentioned variables. This may be due to the existence of other information source, which the owners depended on, (examples self-experience, neighbors and friends).

Table (4.34) Chi- square test for the association between participation of the respondents and their knowledge about importance of vaccination

Degree of participation	Knowledge about importance of vaccination		
	Do not know	To some extent	Full knowledge
Not participate	3	17	47
Rarely	0	1	13
Some time	0	0	9
Always	0	0	10
P value = 9.903	df = 6	Sig = 0.129	

Table 4.34 shows that there was no significant relationship (a = 0.05) between the attendance of extension campaigns and the degree of knowledge about the importance of vaccination.

Table (4.35) Chi- square test for the association between participation of the respondents and their knowledge about importance of A.I

Degree of participation	Knowledge about importance of A.I		
	Do not know	To some extent	Full knowledge
Not participate	53	12	2
Rarely	3	6	5
Some time	5	2	2
Always	2	3	5
P value = 33.196	df = 6	Sig = 0.000	

Table 4.35 reflected that there was significant relationship between the attendance of extension campaigns and knowledge degree about the importance of A.I (a = 0.05). This means that participations influences on knowledge about A.I importance among the respondents.

Table (4.36) Chi- square test for the association between participation of the respondents and their skill in cheese making

Degree of participation	about cheese making skill		
	Do not know	To some extent	Full knowledge
Not participate	58	4	5
Rarely	13	1	0
Some time	5	1	3
Always	6	1	3
P value = 11.842	df = 6	Sig = 0.066	

Table 4.36 shows that there was no significant relationship between the attendance of extension campaigns and the skill degree for cheese making (a = 0.05).

Table (4.37) Correlation matrix showing relationship between some independent variables (experience, income and heard size) and the participation in extension campaigns

Independents variables	Degree of participation	
	R	Sig
Experience	-.259	0.009
Income	-.023	0.821
Heard size	-.028	0.780

Table 4.37 shows that there was significant correlation between the experience and degree of participation of the respondents in extension campaigns (r = -0.259 significant at 0.05). The table also show that there was no significant correlation between the variables (income and heard size) and the degree of participation of respondents in extension campaigns.

Table (4.38) ANOVA for significance variances in education levels and breeding purpose according to participation variable (N= 100)

	Source of variance	sum of square	Df	Mean square	F	sig
Education level	Between group	18.469	3	6.156	3.696	0.014
	Within group	159.891	96	1.666		
	Total	178.360	99			
Production purpose	Between group	1.418	3	0.473	0.884	0.452
	Within group	51.332	96	0.535		
	Total	52.750	99			

Table 4.38 0ne- way analysis of variance (ANOVA) reflected that the respondent's education levels were significantly affect on the respondents participation degree in extension campaigns to acquire knowledge in livestock sector F= (3.696, a =o.o5). This means that education levels influences participation, if the education level will be high, the respondents are more eager to attend and participate in extension programme. Table 4.38 results also revealed that the respondents breeding purpose did not significantly affect the respondent's participation in campaigns (F=0.884, a = 0.05)

CAPTER FIVE

Summary, Conclusion and Recommendations

5.1 Summary of the result

The main results of the study are the following:

- More than half of the respondents (57%) were educated in different levels, which enhance use of printed material.
- In addition to animal breeding more than half (51%) of the respondents were farmers.
- More than half (56%) of the respondents had moderate-income level.
- The great majority of respondents (91%), (80%).possessed local breed, kept animals for milk and meat respectively.
- The results of the study indicated that (73%) of respondents feed their animals on pasture and offered concentrates.
- More than two-thirds (67%) of respondents did not participate in the campaign.
- Most of participated respondents (72%) evaluated extension lectures' as effective method.
- More than half (54%) of respondents confirmed that leaflets were moderately effective.
- The great majority (90.9%) of respondents confirmed that video shows were highly effective.
- More than two-thirds (66.7%, 66.6%) of respondents acquire knowledge in good level, did not acquire any skill respectively.
- The majority of respondents (82%) did not have the skill of cheese making.
- Chi- square test found a significant relationship between the participation and respondent's knowledge about animal nutrition, while the test explained that there was no relationship between the participation and animal health.
- Through One- way analysis of variance, education levels were effect on participation in campaigns.
- Chi-square test reflected significant relationship between participation and respondents knowledge about A.I.
- Significant correlation observed between the participation and the experience (r = -0.259, significant at 0.5.

- Participation in campaigns influence with some factors such as work in other job in addition to livestock producers were not always available when the extension campaigns implemented.

5.2 Conclusion

The study concluded that the extension campaigns have effect to acquiring knowledge to livestock producers because of utilizing multiple methods and means, lectures and video shows are preferable and more effective to transferring knowledge to livestock producers, they are suitable for all groups regardless of age, gender and education level. Developing a better personal relationship between extension agency and the local leaders is a key element in successful extension work.

5.3 Recommendations

The study proposed some recommendations to the ministry of animal recourse and to the livestock producers them self as they represent the backbone of the extension work.

Recommendations to the ministry of animal resource:

1- Extension lectures and video show must use as an effective and preferred methods to acquire knowledge in livestock sector.
2- Make an intensive extension wariness programme about A.I, for changing the local breed.
3 Implementation the extension campaigns, accompanied with field training to acquire skills in cheese making.
4 Necessity of early advertising about the campaigns to insuring the participation of the livestock owners.
5 Necessity of applying the extension participation programme through meetings and group discussion to gain the confidence of the audience. Make further studies in livestock extension especially in extension methods to improve the extension work in south kordofan state.

Recommendations to the livestock breeders:

1- The keenness of attending and participatory in extension programme that implemented in the area.
2- The necessity of building trust between livestock producers and extension agency.

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Appendices

بسم الله الرحمن الرحيم
جامعة السودان للعلوم والتكنولوجيا
كلية الدراسات العليا
ماجستير الانتاج الحيواني في المناطق الحارة

استبيان لدراسة اثر الحملات الإرشادية على معارف ومهارات المربيين فى ولاية جنوب كردفان

هذا الاستبيان لغرض البحث العلمي فقط.

اخى المربى لخدمتكم بتميز ولتوصيل المعلومة العلمية الصحيحة لك وبالطريقة المناسبة نرجو تعبئة هذا الاستبيان بشكل صريح، مع العلم انه سيتم معاملة هذا الاستبيان بشكل سرى للحصول على النتائج ليتم معالجة نقاط الضعف والارتقاء بالعمل الإرشادي في ولاية جنوب كردفان والذي سينعكس ايجابا على مربى الثروة الحيوانية بالولاية.

المنطقة .....

المحلية .....

الولاية .....

تاريخ المقابلة .....

محور المعلومات الشخصية: -

1/ النوع
أ/ ذكر ☐ ب/ انثى ☐

2/ العمر
أ/ اقل من 30 ☐ ب/ 31- 40 ☐ ج/ 41- 50 ☐ د/ 51 فما فوق ☐

3/ المستوى التعليمي
أ/ امى ☐ ب/ خلوة ☐ ج/ أساس ☐ د/ ثانوي ☐ ه/ جامعي ☐
و/ فوق الجامعي

4/ المهنة بجانب تربية الحيوان
أ/ مزارع ☐ ب/ تاجر ☐ ج/ موظف ☐ د/ أخرى ☐ ه/ لا توجد ☐

5/ عدد سنوات الخبرة في مجال تربية الحيوان
أ/ اقل من 5سنوات ☐ ب/ 5 -7 سنة ☐ ج/ 8 – 10 سنة ☐ اكثر من 10 ☐

6/ مقدار الدخل الشهري

أ/ اقل من 5000 ☐ ب/ 5000 – 10000 ☐ ج/ اكثر من 10 الف ☐

7/ الحالة الاجتماعية
أ/ اعزب ☐ ب/ متزوج ☐ ج/ مطلق ☐ د/ أرمل ☐

9/ عدد أفراد الأسرة
أ/ اسرة صغيرة 2- 4 فرد ☐ ب/ اسرة متوسطة 5- 7 فرد ☐

ج/ اسرة كبيره 8- فما فوق ☐

محور الحملات الإرشادية (الطرق والوسائل الإرشادية المستخدمة)

1/ ما مدي مشاركتك في الحملات الارشادية التي تنفذ بالقرية؟

أ/ لا أشارك ☐ ب/ نادرا ☐ ج/ أحيانا ☐ د/ دائما ☐

2/ في حالة عدم الحضور وضح لماذا؟ .....

3/ في حالة عدم المشاركة من اين تتحصل على المعلومات المتعلقة بالتغذية وصحة الحيوان؟

أ/ الخبرات الذاتية ☐ ب/ الجيران والأصدقاء ☐ ج/ الراديو ☐

د/ المرشد ☐ ه/ اخرى ☐

4/ في رأيك ما مدي فعالية الطرق والوسائل الارشادية المستخدمة في الحملة في تعريفك بالمعلومات المتعلقة بتغذية وصحة الحيوان؟

الطريقة الارشادية	درجة الفاعلية		
	غير فعالة	لحد ما	بدرجة كبيرة
محاضرات			
نشرات			
ملصقات			
عروض فيديو			

5/ ماهي درجة استفادتك من الحملة في اكتساب معارف جديدة؟

أ/ لا توجد ☐ ب/ ضعيفة ☐ ج/ وسط ☐ د/ جيدة ☐

6/ ماهي درجة استفادتك من الحملة في اكتساب مهارات جديدة؟

أ/ لا توجد ☐ ب/ ضعيفة ☐ ج/ وسط ☐ د/ جيدة ☐

7/ في رايك كيف كان الاعداد للحملة الارشادية؟

ردئ ☐ وسط ☐ جيد ☐

8/ اقتراحاتك لتجويد الحملات القادمة

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محور المعارف والمهارات

نوع القطيع	العدد			السلالة			الغرض من التربية			
	اقل من 100	200-101	اكثر من 200	محلية	هجين	اجنبية	البان	لحوم	البان+ لحوم	اخرى
ابقار										
ضان										
ماعز										

1/ نظام التغذية المتبعة في القطيع

أ/ رعى على المراعي الطبيعية ☐

ب/ رعى + تقديم علائق مر كزة مكملة ☐

2/ ما مدي معرفتك بطريقة تغذية الحيوانات الحوامل؟

لا اعرف ☐ لحد ما ☐ معرفة تامة ☐

3/ ما مدي معرفتك بطريقة تغذية الحيوانات المنتجة للبن؟

لا اعرف ☐ لحد ما ☐ معرفة تامة ☐

4/ تقديم مكعبات الاملاح للقطيع

أ/ لا اقدم اطلاقا ☐ ب/ نادرا ☐ ج/ أحيانا ☐ د/ دائما ☐

5/ معرفة علامات الصحة والمرض في القطيع

لا اعرف ☐ لحد ما ☐ معرفة تامة ☐

6/ ما مدى معرفتك بطرق انتقال الامراض المشتركة من الحيوان للإنسان

المرض	لا اعرف	لحد ما أعرف	أعرف تماما
البر وسيلا			
السل			

7/ ما مدي معرفتك بطرق وقاية الحيوانات من مرض

المرض	لا أعرف	لحد ما أعرف	معرفة تامة
أبو زقالة			
الحمى الفحمية			
التسمم الدموي			

8/ ما مدي معرفتك بأهمية تحصين القطيع؟

لا اعرف ☐ لحد ما ☐ معرفة تامة ☐

9/ ما مدي معرفتك بأهمية وفائدة التلقيح الاصطناعي؟

لا اعرف ☐ لحد ما ☐ معرفة تامة ☐

10/الفائض من الالبان في موسم الخريف يصنع منه

أ/ روب ☐ ب/سمن ☐ ج/ جبنة بيضاء ☐ د/ لا يصنع ☐

11/ هل تمتلك المهارة للقيام بكل خطوات تصنيع الجبنة البيضاء؟

أ/ لا أمتلك ☐ لحد ما ☐ نعم بدرجة كبيرة ☐

One of the producers filling the questionnaire with the researcher

Culba area

One of the women answers the questionnaire

System of animals housing in south kordofan state

Zareeba

Addition feed offered to the calves

Culba area – south kordofan state