

بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Graduate Studies

**Impact of Agricultural Extension activities on the
performance of agricultural Cooperatives**

(Wad Ramli cooperative Khartoum Bahri)

أثر الأنشطة الإرشادية الزراعية علي أداء التعاونيات

الزراعية

(جمعية ود رملي التعاونية الخرطوم بحري)

By: Abdalla Mohammed Ali Eljenay

Supervisor:

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Co-supervisor:

Dr. Souad Ibrahim

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A Thesis Submitted to Sudan University of Science and Technology
College of Agriculture Studies in Partial Fulfillment of the Requirements
for the Ph.D. Degree in Agricultural Extension and Rural Development

By

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الآية الكريمة

قال تعالى

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(وَتَعَاوَنُوا عَلَى الْبِرِّ وَالتَّقْوَىٰ وَلَا تَعَاوَنُوا عَلَى الْإِثْمِ

وَالْعُدْوَانِ وَاتَّقُوا اللَّهَ إِنَّ اللَّهَ شَدِيدُ الْعِقَابِ) سورة المائدة:

الآية 2

DEDICATION

This thesis is dedicated to those whom I love most

To my mother,

My Father

My Brothers and Sisters

To my wife my family, and to my thesis supervisors for helping

For their support to make this happened

I also dedicate this dissertation to my friends who have supported me

throughout the process

.I will always appreciate all they have done .

Acknowledgments

Raise is to the benevolent and powerful creator Allah who bestowed on us the creative flair to this thesis and for giving us the strength to complete this work and make everything possible.

The process of writing this PhD dissertation has been one of the most humbling and self reflecting experiences for me. I would like to express my gratitude to a number of people who supported me throughout this journey.

I have been fortunate to work with someone with the professional and academic expertise Prof. Elshafa Ali as a major Professor. Prof. Elshafa not only provided me with the necessary guidance and encouragement to complete this research but also helped me to get the support needed for the data collection. I am also grateful to Dr. Souad Ibrahim my co-professor. I wish also to express ray gratitude to the other members in the department of agricultural extension and rural development in the Sudan University of Science and Technology I would also like to express ray thanks and appreciation to My colleagues in General Directorate of Extension and Technology Transfer the Federal Ministry of Agriculture for their assistance, moral support and their help extended in the preparation of this document, through discussions and comments. Also, I would like to express ray deepest gratitude and share this honor with my friend Ahmed Hamdi for helping me in analyzing the data.Finally, I would like to thanks Dr: Adil Yousif for his help extended in the preparation of this document, through discussions, comments. Dr: Adil is our spiritual father in agricultural extension through the encouragement and moral support of creativity and learning

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Abstract

This study was conducted in Wad Ramli Agricultural Cooperative in Khartoum locality during 2017 – 2019. The study aimed to assess the impact of agricultural extension activities and services on the performance of cooperatives members and measure their attitude towards these activities on increasing their income and also their attitude towards the principles of the cooperatives. Social survey was used to collect the data from the members of cooperative. 292 members selected randomly from the homogenous members of the cooperative using scientific statistical formula.

The data was analyzed by the computer idea package for social science (SPSS) using different statistical procedure, frequency and percentage distribution, likert scale and chi-square test. To measure the relationship between agricultural extension activities provided and the increased income of the members. The results showed that some of the activities provided by the Agricultural Extension office to members, such as farmers' fields schools and demonstration fields, had a clear role in increasing the income of some members, and some activities such as field extension visits and farmers knowledge about the general principles of cooperation did not satisfy the farmers.

Based on this result the research recommended the following.

1. Intensifying extension programs and educating members about their benefits through monitoring and evaluation by agricultural extension agents in the area.
2. Linking farmers to other relevant cooperatives to presenting some successful experiences.
3. Awareness of the importance of cooperative work and their benefits.

مستخلص الدراسة

أجريت هذه الدراسة في محلية الخرطوم بحري بجمعية ود الرملي التعاونية الزراعية خلال الفترة 2017 - 2019.

هدفت الدراسة إلى تقييم أنشطة الإرشاد الزراعي على أداء أعضاء التعاونيات الزراعية ، و معرفة رضا المزارعين عن الخدمات الإرشادية التي يقدمها مكتب الارشاد الزراعي بالمنطقة ،والمبادئ العامة للتعاون. عليه تم إستخدام الدراسة الوصفية عبر الاعضاء المسجلين في الجمعية وتم جمع البيانات باستخدام استبيان منظم تم تحليله بواسطة برنامج الحزم التقنية للعلوم الاحصائية (SPSS) و حساب التكرارات والنسب المئوية المستخدمة في برنامج أنشطة الإرشاد الزراعي ومقياس Likert لتوضيح إتجاه الأعضاء نحو المبادئ العامة للتعاون ، كما تم استخدام اختبار Chi-Square ، لإظهار العلاقة بين أنشطة الإرشاد الزراعي التي طبقت وزيادة الدخل بالنسبة للاعضاء . أظهرت النتائج ان بعض الانشطة و الخدمات التي يقدمها مكتب الارشاد الزراعي للاعضاء مثل مدارس المزارعين و الحقول الايضاحية بالمنطقة كان لها دور واضح في زيادة الدخل لبعض الاعضاء ، كما ان بعض الانشطة مثل الزيارات الارشادية الحقلية و معرفة المزارعين بالمبادئ الاساسية للتعاون لم تنل رضا المزارعين ،.

خرجت الدراسة بعدة توصيات اهمها

1. تكثيف البرامج الارشادية الزراعية و توعية الاعضاء بفوائدها عبر المتابعة و التقييم من قبل المرشدين الزراعيين بالمنطقة.
2. ربط المزارعيين بالجهات ذات الصلة بتقديم بعض التجارب الناجحة للاقتداء بها.
3. التوعية باهمية العمل التعاوني و فوائده.

Chapter one: Introduction

1-1 Background:

The word “Extension” was first time used in Britain in 1840 in the form of “University Extension” or “Extension of the University”. In 1850, William Sewell of Britain used it in his report entitled “suggestions for the extension of the university”. But, this word was first used in a practical way by James Stuart of Trinity College, Cambridge University in 1867-68, when he was addressing “Women Association and Working Men’s Clubs” of North England. Again in 1871, he appealed to the officials of the Cambridge University to establish extension centers under the supervision of university, so that these centers can be used as a platform to deliver lecture to the people. His effort in this field was responsible for him being called “Father of University Extension”. In a formal way Cambridge University in 1873, London University in 1876 and Oxford University in 1878 developed extension system which worked among people. In 1880, his work came to be known as “Extension movement”.

In the eighth decade of the 19th century the word Extension was used in the form of Extension education in U.S.A. The reason was that in the latter half of the 19th century rural people had started migrating to urban areas. This led to two major problems in U.S.A.

- (i) Due to the migration of rural people to cities,
- (ii) The increase of urban population created education, employment and housing related problems.

Therefore to solve this problem the Philadelphia Committee was established in 1785. The committee suggested that in order to keep rural people in rural areas “Out of school education” should be given to them. According to

Webster's dictionary the term "Extension" means "Branch of a university for student who cannot attend the University properly". In other words, the word 'Extension' is used in the context which signifies an out of school system of education." In 1862 President Roosevelt established a "county commission" under the chairmanship of Lavery Hydevelle. Its objectives were:

- (i) How to stop migration of rural people to cities?
- (ii) How to engage rural people in agricultural and rural development programs?

It was due to the fact that industrial development is not possible without agricultural development, so maximum people must live in the villages and help in the agricultural development. County commission in its report stated that firstly, there is vast difference between rural and urban life and this should be lessened. It further stated that the standard of living of rural people can be uplifted permanently only when they themselves make an effort in this direction. Secondly, in order to encourage people to take initiative, it is prerequisite that the change in the field of knowledge, understanding, skill and attitude should be brought about.

In order to implement the above recommendations educational work has to be taken upon. Therefore, county commission recommended the establishment of an institution, which can organize out of school education. Keeping this in mind Smith-Lever Act (1914) was passed and this Act led to the integration of cooperative extension service according to which out of school education was organized. As a result, rural people were able to bring about developments and progress in farming and housing this type of education comes to be known as "Agricultural Extension Education". Dr. Jitendra Chauhan (2007)

Agriculture and agricultural extension service are facing numerous problems in Present times where good solutions are not easy to find, providing of agricultural extension service is important to stimulates the development of agricultural production, agricultural extension activities must provide effective link between holdings-producers, agricultural research and other sources of information and must be aware of psychosocial and social aspects of group action and individual counseling, Extension service in agriculture is indispensable and it offers more than just expert assistance in improvement of production and processing, it also enables flow of information and transfer of knowledge and scientific findings to practice. These activities are performed according to rules which regulate establishing of organization, functioning, goals and fields of operation, ways to execute extension activities by the extension agent, their obligations and rights, Živković, (2009). A cordoning to Ministry of Agriculture, Govt. of India, 2013,agriculture extension is generally described as a process and a system in which information, knowledge and skills relating to farming practices are transmitted through various channels and methods to its clients .

Extension is a programme and a process of helping village people to help themselves, increase their production and to raise their general standard of living. We can define Extension as the increased dissemination of useful knowledge for improving rural life, Extension is a two-way channel it brings scientific information to the village people, and also takes the problems of the village's people to the scientific institution for solution it is a continuous educational process, in which both learner and teacher contribute and receive.

From the above definitions we can concluded that extension is an education and it is bringing a desirable change in behavior, knowledge, skills and attitudes of rural people to improve their social, economic.

In the framework of this concept the functions of guidance, devices, include all or some of the following functions:

- 1.The Transfer of Knowledge.
- 2.The Farmers' Education .
- 3.Advice provision to farmers.
- 4.Organizing the farmers. Chauhan, (2000).

The agricultural sector is characterized by the high number of producers in wide geographical areas, these circumstances lead to weakening their influence and their participation in the determination of the agricultural development policy, these considerations highlight the importance of organizing the farmers in the framework of farmers unions or cooperatives to provide representative bodies to express and defend their interests by providing the inputs, their need or marketing their products in addition to the provision of guidance and educational information,

Organizing producers into cooperatives Lead to increase their purchasing power for inputs and enforce their marketing power as producers. Following that the cooperative framework gives them bargaining power which provides them with the more not just deals through their control of the largest transaction of sales and purchases that ends in providing the lowest price and the best quality of inputs and a higher price for their marketed products. So organizing the cooperatives considered to be a defensive move to correct the shortcomings of the market mechanism.

Cooperative is a private business organization that is owned and controlled by the people who use its products, supplies or services.

Although cooperatives vary in type and membership size, but were formed to meet the specific objectives of members and are structured to adapt to member's changing needs.

Cooperatives are formed by individuals who coordinate among themselves horizontal coordinate to achieve vertical integration in their business activities, people have been working together for their mutual benefit throughout human history, and the cooperative form of the business organization began during the Industrial Revolution. Machida, (2011)

Cooperatives were useful for promoting the interests of the less powerful members of society, farmers, producers, workers, and consumers found that they could accomplish more collectively than they could individually, a cooperative is a unique form of private business organization that has been widely used for more than 100 years especially in nations whose political systems are democratic and whose economies are capitalistic and market-oriented, although it is common in many parts of the world (Barton,2000).

The Farmers Organizations have played and play an active role in the economic life and in achieving development in advanced countries such as Japan and the United States through direct monitoring programs and provide many services to farmers Some European countries tend increasingly to give the civil organizations an important role to provide these counseling services in the future to farmers. And have to work in developing these organizations to provide an opportunity for the citizens of rural areas to contribute and participate through the human and material resources, in order to achieve justice in developing countries, the purpose of the agricultural cooperatives is to double participation among farmers in the development, increase capital resources improve farmers economic, social conditions and to enhance practicing of agribusiness through democratic management.Chauhan,(2016).

1-2 Problem Statement:

Cooperation process as social phenomenon is old and ancient as human history, it includes many of the patterns of collective activities among individuals in solidarity helping each other through mutual assistance targeting to achieve economic goals that could not be achieved through individual efforts.

The cooperation system is important means in collecting the citizens' material and technical potentials and in resting them in ambitious way to achieve the cooperatives member's desires in that regards.

The extension activities in agricultural cooperative is that methods or process which aims to transfer and diffuse knowledge among the targeted group and equip them with technical skills through non formal education system , to improve their productivity, provide them with advice in farm management, help them to take the appropriate decisions on objective economical grounds and motivate them to organize themselves for self reliance in addressing their problems in order to raise their standard of living through sustainable development.

So the extension activities in agricultural cooperative to be effective need to improve efficiency in the following key areas:

- Responding to the needs of members by encouraging member participation
- Providing technical sport in areas of marketing and supply.
- Enhancing higher economic returns to members through organize themselves.
- Delivering adequate and family credit facilities leading to higher productivity

- ◆ Offering a high level of marketing information enabling better business decisions.
- ◆ Demonstrate a high level of managerial efficiency leading to a better good will.

Although the agricultural cooperatives in Sudan have been established a long-standing (1948) the registration of the first cooperative, which was Wad Ramli agricultural cooperative, but still there is a noticeable decline in the living standard of a rural household, in reduction their production.

So the main aim of this study is to assess the impact of agricultural extension activities in wad Ramli agricultural cooperative on performance of their members.

1-3 Research objectives:

The general objective of this research to assess the impact of agricultural extension activities on the performance of Wad Rmli agricultural cooperative members:

Specific objective is:

- ◆ Analyze the agricultural extension activities provided to the cooperative.
- ◆ Measure technical support of agricultural extension activities in the area of:
 - Marketing information.
 - Use of advance technologies.
 - Provision of credit
 - Advice in farm management.
- ◆ Measure relationship between member's participation in agricultural Extension activities and their income increased.
- ◆ Measure the member's attitude towered the agricultural extension activities provided, and the principles of the cooperatives.

1-4 Research variables:

<u>Independents</u>	<u>Dependents</u>
<p>agricultural Extension activities:</p> <ul style="list-style-type: none">- farmers field schools- Demonstration fields.- Field office & visits.- Training & courses- Extension messages- Training program. <p>Agricultural extension services</p> <ul style="list-style-type: none">- farm management- provision of credits- Marketing services.- advance technology.- cooperatives management	<ul style="list-style-type: none">- Members participation.- The increase Members income.- The knowledge increase in marketing information.- Attitude of the members towards the principles of cooperatives and extension activities.

1-5 Research hypnoses:

The overall hypnoses:

1-There is no significant relationship between agricultural extensions activities implemented in Wad Ramli agricultural cooperative and the performance of cooperative members?

2- The attitude of the members toward the principles of cooperative and the extension activities implemented is negative

1-6. Research Questions

- ◆ Is the cooperative efficiently managed by trained and professional – qualified staff under the supervision and control of democratically – elected board of directors ?
- ◆ Is the cooperative integrated the operation with the need of their member house hold?
- ◆ Is the cooperative under take comprehensive programmes for members’ education to facilitate the process of members’ participation, members’ involvement and empowerment?
- ◆ Is the agricultural extension viable and strong linkages with external research and development extension agencies in the field of agriculture and technology?
- ◆ Is the cooperative strive to become self – reliance accumulate capital and develop other resources in order to remain free from all external control and directions?
- ◆ Is there any professional management to implies both an act the a process of planning organizing, directing, coordinating, implementing, monitoring and controlling in an organization with a view to use it is resource efficiently and effectively?

1-7. the research importance:

The importance of this research comes from the importance of cooperatives role in human life special in Agriculture sector through farmer’s activities, also it comes from the globosity of cooperative law and principles which it find all over the world, and it had big impact and social role in third world and Sudan is one of this world .

Also it comes from cooperatives impact in Sudan special in farmer's organizations from long time, were than others farmer's organizations such: farmers unions, social activities and so on.

So this research well views aspects that agricultural extension activities put on Wad Ramli agricultural cooperative and economic impact to the farmers.

1-8 The Research organization:

This research is organized in five Chapters:

Chapter one: introduction:

Background

Problem statement

Research objective

Research variables

Research hypotheses

Research Questions

Research importance

Research organization

Chapter two consists of:

Literature review, which include

1. Definition, concept, principle, of extension and Agricultural extension approach
2. Agricultural extension activities in cooperatives
3. Definition, principle, and benefit of cooperatives, significant of agricultural cooperatives.
4. Development of agricultural cooperatives in Sudan.
5. Role of farmer's cooperatives in agricultural development.
6. Wad Ramli agricultural cooperative.

Chapter three: Research Methodology

The study area

The study population

Sample size

Data collection

Method of data collection

Study Tools

Data analysis

Chapter four:

Data analysis, results and discussion

Chapter five:

Summary of the results,

Conclusions and recommendations

Appendix

Chapter Two

Literature Review

Section One

Agricultural extension

2-1 agricultural extension:

The Concept of Agricultural Extension has a wide range of definitions; it is defined by many scholars in different parts of the world, Swanson (1984) stated that "Extension is an on-going process of getting useful information to people (the communication dimension) and then in assisting those people to acquire the necessary knowledge, skills and attitudes to utilize effectively this information or technology (education dimension)" Maunder (1973)) as cited by Swanson (1984), defined agricultural extension as "A 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 the social and educational standers of rural life'" Rolling (1982) viewed extension as "extension means different things to different people, but most people regard it as a government instrument to promote technologies for improving agricultural production and farmer's income. "Agricultural Extension plays essential role as communication channel to transfer new ideas and innovations to the farmers where they are. It encourages them to use and adopt the innovations to increase agriculture product and hence improve their standard of living. That is mainly, because the Agricultural extension contributes directly to promoting agricultural development and rising of food production and income so as to improve living conditions of the farmer because the farmer faces problems and barriers to reach that goal the

conventional definition of agricultural research includes both applied research and extension. Anderson, (2007). Essentially extension services act as a bridge between scientists who strive to resolve problems in the practice of agriculture through research and the farmers who need the solutions. Innovative technologies and good practices can be translated to increased yields and improved food security only when it is properly communicated to farmers Annie and Merle (2012). Bello- (2014),

Extension is one of the government policy mechanisms that have an important role to play in developing agriculture, hence many governments in the world have ministry of agriculture with extension and research components.

Today extension works to translate science for practical application, identify emerging research questions find answers and encourage application of science and technology to improve agricultural economics and social condition. Zwane, (2014)

2-1-1. Definition of agricultural extension:

Previously (FAO- 1985) the extension is a term which is open to a wide variety of interpretations. Each extension agent probably has his own understanding of what extension is. This understanding will be based on past experience and the particular type of extension service in which the agent is working. In other words, there is no single definition of an extension which is universally accepted or which is applicable to all situations. Furthermore, the extension is a dynamic concept in the sense that the interpretation of it is always changing. Extension, therefore, is not a term that can be precisely defined, but one which describes a continual and changing process in rural areas.

Extension is an informal educational process directed toward the rural population. This process offers advice and information to help them solve their problems. Extension also aims to increase the efficiency of the family farm, increase production and generally increase the standard of living of the farm family.

The objective of extension is to change farmers' outlook toward their difficulties. Extension is concerned not just with physical and economic achievements but also with the development of the rural people themselves. Extension agents, therefore, discuss matters with the rural people; help them to gain a clearer insight into their problems and also to decide how to overcome these problems.

Extension is a process of working with rural people in order to improve their livelihoods. This involves helping farmers to improve the productivity of their agriculture and also developing their abilities to direct their own future development. Extension is essentially education and it aims to bring about positive behavioral changes among farmers. 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. According to FAO, (2001), Agricultural extension is the application of scientific research and knowledge to agricultural practices through farmer education. Generally agricultural extension can be defined as the delivery of information inputs to farmers.

The role of extension services is invaluable in teaching farmers how to improve their productivity, Extension is also critical to move research from the lab to the field and to ensure a return on investment in research by translating new knowledge into innovative practices.

Research Centre ◀▶ Extension Personnel ▶▶ Problems of People.

2-1-2. Concept of agricultural extension:

A concept of agricultural extension widely used in FAO is one included in the FAO publication Agricultural Extension: A Reference Manual Swanson, (1984). Agricultural extension is « a 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 the social and educational standards of rural life ». A definition, revised in the light of the World Conference on Agrarian Reform and Rural Development (WCARRD) and other developments since 1973, might refer specifically to men, women, youth, and the most disadvantaged groups in general, encouraging and involving rural people's own organizations, enhancing individual and collective self-reliance, and environmental and population issues. According to Altayeb, (2005) the broad concept of agricultural extension as an informal way of teaching, Agriculture is not new; in ancient times farmers learned from their own experiences and the experience of the previous generations they passed on their farming knowledge to the offspring. It was an informal way of education, it was not organized, and it had very little resemblance to what now has become conventionally recognized as agricultural extension service. Agriculture in Khartoum State is an important sector in the state economy, owing to the growing demand for farm products resulting from the rapidly growing population in the State.

2-1-3. Principles of Extension

The Extension is practiced throughout the world and it is guided by principles. Many authors like (Bembridge, 1991; Garforth and Oakley, 1985, Van den Ban, 1990) have come with new principles however the differences are minimal except that the emphasis tended to focus on how these principles are applied.

Extension works with people not for them: Extension works with rural people. The extension officer does not take decisions for the farmers, but guide them to take decisions to solve their problems. People have more confidence and projects tend to be sustainable because participants own the decision.

Extension is accountable to its clients: Extension services and officers have two sets of masters. This is a difficult to maintain a balance, because on one hand they are accountable to their senior officers and to the government. The extension officers are expected to follow official policies and guidelines in their work. On the other hand, extension is the servant of rural people and it has the responsibility to fulfill the needs of the people in the area where it operates Garforth and Oakley, (1985).

The extension is a two-way link: a process in which the extension officer transfers knowledge and ideas to farmers and their families, but it should be a two-way flow of ideas, suggestions, or even advice. Extension bridges the gap between the farmer and research, (Ibd). Extension cooperates with other rural development organizations. Extension services should work closely with other organizations found in the rural areas that provide essential services to the farmers; such organizations include political, health services, support organizations, local schools, and community development.

The Extension works with different target groups: Extension recognizes that not all farmers in one area will have the same problems, for example they will have differential access challenges to resources. Different groups cannot be offered a single package of advice suitable to all farmers different groups need to be identified and each be assisted to have programme appropriate to each group.

Extension provides technical knowledge and information: Extension provides technical knowledge and information to assist farmers to improve their farming. The information can be related to crops, animal, economics, and natural resources. Extension work has evolved basic working principles which are necessary for an extension worker to follow in planning and practicing extension activities. These principles are mentioned below.
Ephenia Kekana, (2014)

2-1-4 Agriculture & rural extension:

Extension is essentially education and it aims to bring about positive behavioral changes among farmers. 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.

Agricultural extension is the application of scientific research and knowledge to agricultural practices through farmer education. Generally agricultural extension can be defined as the delivery of information inputs to farmers.

The role of extension services is invaluable in teaching farmers how to improve their productivity, Extension is also critical to move research from the lab to the field and to ensure a return on investment in research by translating new knowledge into innovative practices FAO,(2001)

There are, however, certain global developments that demand a fresh vision if the agricultural and rural extension institutions in the developing countries are to be revitalized and made more effective and efficient. This vision encompasses institutional reforms towards both market-oriented privatizing innovations and non-market decentralizing reforms and constitutes the backdrop against which a new vision can be applied. In addition to technology transfer, the agricultural and rural extension is a unique service in that it provides access by small farmers and the rural poor living far from the urban centers to non-formal education and information services. While it can provide these populations with services to increase their productivity, their food security will depend on institutional development and income-generation, together with increased food crop output. William, (2001)

2-1-5 Extension services

Extension services are classified into three types:

1. Technology transfer – the traditional model of the transfer of advice, knowledge and information in a linear manner.
2. Advisory – the use by farmers of a cadre of experts as a source of advice in relation to specific problems faced by them.
3. Facilitation – the aim of this model is to help farmers to define their own problems and develop their own solutions.

Traditional extension systems focus on increasing agricultural productivity use a top-down approach and often emphasis the transfer of technology. This model for extension, however, is becoming out-dated in the more competitive, market-oriented climate of today's agriculture. Alternative models have emerged that recognize other actors than traditional public extension services – including agribusiness companies, non-government

organization (NGOs), agro-dealers, producer organizations and farmer to farmer exchanges Chauhan,(2007).

2-1-6 Agricultural extension approach:

Respective success of Agricultural extension approaches:

The word "approach" refers to the style of action within and extension system. The approach embodies the philosophy of the system. It is the essence of the system. It like the beat of the drummer, which sets the pace for the entire activity of the system, but it is not merely one of the components of the system. It is more like a doctrine for the system which informs, stimulates and guides. Such aspects of system as its structure, leadership, programme and methods and techniques

The main agricultural extension approaches are eight different approaches described and compared; they are listed here, and will be described in detail, with example below.

(1) The general agricultural extension approach: Success is measured in terms of the rate of take-up of the recommendations, and increases in national production.

(2) The commodity specialized approach: The measure of success is usually the total production of the particular crop.

(3) The training and visit approach: Success is measured in terms of production increases of the particular crops covered by the programme.

(4) The agricultural extension participatory approach: Success is measured by the numbers of farmers actively participating and benefiting, and the continuity of local extension organizations.

(5) The project approach: Short-run change is the measure of success.

(6) The farming systems development approach: Success is measured by the extent to which farming people adopt the technologies developed by the programme and continue using them over time.

(7) The cost sharing approach: Success is measured in terms of farm people's willingness and ability to share some of the cost, either individually or through their local government units.

(8) The educational institution approach: The measure of success is the farming people's attendance at and participation in the school's agricultural extension activities.

(9) Farmers' Field School (FFS) approach: participatory extension approaches which emphasize the participation of local people and their communities working in groups and building upon the traditional or indigenous knowledge that they have acquired. Discovery learning is emphasized on FFS.

This is certainly not intended to be an exhaustive type listing. More importantly, characterization of the different approaches in terms of their success tends to distort some of them. It nevertheless helps to distinguish certain basic approaches World Bank, (2010).

Sudan has tried a number of extension approaches and models including commodity approach, Training & Visit (T&V) system and Farmer Field School (FFS) IFPRI, (2012). Nowadays, agricultural extension services in Sudan use different extension approaches to transfer technology packages and agricultural knowledge to farmers such as: Commodity Development approach; Conventional approach; Training & Visit approach; ; Integrated Agricultural Development Approach (IADA); Integrated Rural Development approach and Farmers' Field School (FFS) approach (El Hassan,2004; Mohamed,2010; Omer,2013). Mofereh (-2016).

2-1-7. Agricultural Extension in Cooperative Formation

This section will look at how extension workers reintegrate farmers in to forming a cooperative society. A step -by-step method of forming a cooperative movement will also be enumerated. Just like in most rural communities, the bulk of the inhabitants are illiterate. To form a cooperative society, it becomes the responsibility of the extension agent to organize such a people even if the people took him initiative of organizing a cooperative society they will need the support and advice of the extension officer, who is seen by the rural communities as a spokesman of the government, Why is there such a plethora of extension approaches? Some ideas change; paradigms shift; and purposes vary. But lessons are also learned, and then shared. It becomes clearer why one or other approach has succeeded or failed, and which aspects of a particular programme are useful and which are not BWALA, (2015).

2-1-8. Extension in Cooperative Management:

The traditional function of extension is education. Its operational strategy is to provide link between a source of knowledge, idea and information to the ends users who in most instances are the rural farmers; it's therefore the duty of the extension officer to disseminate all information, complex knowledge in its practical forms. Ideally the role of extension is not to educate only the rural poor but the urban poor too. But the extension programme devoted more time and effort to supply and supervisory activities. The question now is where does extension features exist in cooperative?

A suggested approach is examined for extension to assume after the formation of a cooperative society. The approach should be that of linkage role and act as a liaison between the client (farmers) and any other credit source. One of that can assist farmers with a financial backing when they

form themselves into a cooperative society. While the extension services will only play a lesson role and nothing more. The extension department can lead the farmers to the banks and at time introduce to the bankers but as earlier mentioned as a matter of principles avoid being collaterals or guarantors. This section will deal with the role of extension in cooperative administration and management. While the next section looks at the benefit of cooperative societies to small scale farmers. Ortmann, (2007).

2-1-9. agricultural extension activities in cooperatives

The general objectives of extension are

1. To assist people to discover and analyze their problems and identify their felt needs.
2. To develop leadership among people and help them in organizing groups to solve their problems.
3. To disseminate research information of economic and practical importance in a way people would be able to understand and use.
4. To assist people in mobilizing and utilizing the resources which they have and which they need from outside.
5. To collect and transmit feedback information for solving management problems. **MANAGE**, (2007)

According to Kelsey and Hearne (1967), the basic philosophy of extension education is to teach people how to think, not what to think. Extension's specific job is inspiring, supplying specific advice and technical help, and counseling to see that the people as individuals, families, groups and communities work together as a unit in 'blueprinting' their own problems, charting their own courses, and that they achieve their objectives. Sound extension philosophy is always forward looking. This philosophy becomes the foundation of needs and levels of extension According to National

Institute of Agricultural Extension Management, in India,(2013). This fact emphasized the need for a rapid extension programme because; The Community Development Programme is a multipurpose extension programme which includes farm and nonfarm sectors of livelihood. It achieved tremendous results and benefits in the field of agriculture, rural development, social and economic development. The Community Development Programme (CDP) made a significant impact in the rural people for their own development in all aspects of their day to day life. It was so successful and purposeful that United Nations defined the Community Development Programme as “the process by which the efforts of the people themselves are united with those of governmental authorities to improve the economic, social and cultural conditions of communities, to integrate these communities into the life of the nation and to enable them to contribute fully to national programmes”. The CDP which emphasized development in all spheres of people’s life slowly directed towards specific objectives attainment as over the years it was felt necessary. For example Neuchatel (2007), confirmed that a well-designed extension services contribute to improving agricultural production, land use systems, reduce rural poverty and equitable economic development through facilitating access to market for farm supporting the sustainable management of natural resources, enhancing the management of rural communities and other agricultural sectors, Agricultural cooperatives are seen as some of the enterprises that can be assisted by extension to become sustainable hence the role of extension is investigated in this regard.

Section Two

Cooperative

Definition, principles, and Benefits of The cooperatives

2-2-1. Definition of cooperatives:

The international cooperative Alliance ICA (2004) defines cooperative as autonomous association of persons united voluntarily to meet their common economic social and cultural needs and aspirations through jointly owned and democratically controlled enterprise. A cooperative is meant to embody the values of self –help, honesty, openness, self responsibility, social responsibility, democracy, equality, equity, solidarity, mutual caring, efficiency, effectiveness, transparency and accountability.

The cooperative movement began in Europe in the 19th century, primarily in Britain and France and play significant role in the agricultural sectors of many countries. The first attempts to start modern and structured cooperatives in Sudan were initiated in 1921 during the colonial period by a British District Commissioner in the Delta Tokhar cotton estates; to the East of the country Al-Otaibi, (2007).

2-2-2. principles of cooperatives:

The international cooperative Alliance (ICA) Identifies principles guide the formation organization and activities of Cooperatives as follows:

1. Voluntary and open membership: They are not intended to have discriminatory membership requirements.
2. Democratic member control. Members have equal voting rights, one member one vote.
3. Member economic participation: Members contribute to the capital of their co-operative. Surplus can be allocated back to members in the form of

equity or it can be allocated for developing the co-operative, creating a reserve or to support other member approved activities.

4. Autonomy and dependence. Co-operatives are self-help organizations that are controlled by their membership.

5. Education, training and information Local co-operatives are to provide education and training to their members to ensure that each member can contribute effectively to the progress of the co-operative.

6. Cooperation among cooperatives. The co-operative movement is most effective by working together with other co-operatives at different scales; local, regional, national or international.

7. Concern for community. Cooperatives, by their nature, are focused on the needs of their members. Through attempting to achieve these needs, co-operatives work towards sustainable development of their communities.

Agricultural cooperative which does not observe these principles would be difficult to continue its activities this International Cooperative Alliance principle was made based on a long period of experience of movement.

In 1987 the United States Department of Agriculture (USDA) adopted just the three principles of user ownership, user control and user benefit roughly the first three International Cooperative Alliance principles following arguments that cooperatives operating in global markets, particularly agricultural marketing and supply cooperatives. GF Ortmann & RP King1, (2007)

2-2-3. Agricultural cooperatives benefits:

Based on the United States Department of Agriculture (UNDP) Religion Center for Europe and the CIS, (2005), agricultural cooperatives offer a range of benefits that may accrue at all stages in production cycle such as:

1. Purchasing power to leverage lower prices for factors inputs.
 2. Investment in equipment and new technologies reduce unit costs of production.
 3. Increases productivity and enables the transition in to new value – adding activities e.g., processing and packing. As a result a greater share of market power and value added is channeled back to primary producers, promoting farm level reinvestment and the development of farm entrepreneurial activity.
 4. Marketing and distribution, farmers' enterprises investment in transportation logistics, whole sales and retail distribution enables individual producers to avoid dependence on intermediaries and retain a higher proportion of sales revenue.
 5. Gradual formalization of informal activity in many countries the majority of small Scale farming activity take place in the formal sector, limiting access to financial services and undermining the ability of governments to invest in new social and economic infrastructure.
 6. Increased surpluses: leading in turn to higher incomes and local multipliers contributing to local economic development (Ibd).
- Cooperatives empower people to improve their quality of life and enhance their economic opportunities through self-help (Ibd).

2-2-4. significance of agriculture cooperatives:

Small-holder farmers remain the back bone of agricultural production especially in the developing countries including Sudan. Mohamed (2004) Remarked that farmers burdened with high prices of farm inputs in efficiency of farming techniques, inadequate production infrastructure, poor market and heavy constraints in obtaining credits facilities.

Agenyour, (2014).In addition to the principals and benefits of cooperatives, studies has been conducted on wide varieties of issues relating to the importance of co-operatives societies.

Veerkumaran (2005) Explained that cooperatives serve as fundamental tool for achieving food security at household level. Cooperatives are the best institutional intervention for attaining food security in many countries. the developed nation like united state of America, Canada, and Australia, almost all European countries and socialist Country like china gave attained food self- sufficiency through cooperatives.

Chambo (2009) Most Women in developing countries have limited access to productive resources, which hampered them not to earn incomes and activity participate in economic and political conditions .

Kebeer (2005) In this situation, cooperative have played significant role in empowering poor women.

UNDAW (2001) Defined empowerment as the process by which people who are powerless become aware of the power dynamics at work in their lives context, develop the skill and capacity for gaining some reasonable control over their lives exercise this control without infringing upon the rights of others and support the empowerment of others.

Boviah (2006) Women in Bangladesh were highly discriminated and were not participating in productive activities. The government motivated them to organize themselves under cooperatives and solved their problems together, They have organized and formulated cooperative institutions. Hence they have addressed gender inequalities by mobilizing saving from members to develop businesses.

Pichiavaram (2003) has made a comparative study between state and cooperative farming system contribution to gross domestic producer in India

using panel data from 1994 to 2002. The result indicated that agricultural cooperatives has produced more output with higher productivity than state owned agriculture, with an average annual growth rate 5% higher than the state owned .The cooperative sector has also contributed more to GDP (14%) and agriculture output (37%) than state agriculture , which respectively contributed 1.2% and 9% .

Another study was conducted in Canada by using eight years panel data on the roles of cooperative societies on the economic growth. The study concluded that expansion of agricultural cooperatives is a good means of achieving food self, sufficiency at a house hold level. Fairbaim, (1999).

A similar study was carried out in the Sudan about the role of Agricultural cooperatives in the national economy using four consecutive year's panes (data 2000-2003).97 sample cooperative societies were selected for the study. The result showed that these cooperatives have contributed on average about 23%of the national product. It also indicates that the average annual expenditure and income of members have dramatically improved in a short period by 13% and 19% respectively. The study concluded that agricultural cooperatives are important for expenditure Dayandiach, (2004).

2-2-5. Types of Cooperatives:

- **Non-monetary Cooperative:** The idea has been said to reduce general human consumption of goods a key subject in sustainable development.
- **Retailers' Cooperative:** This is an organization that employs economies of scale on behalf of its members to receive discounts from manufacturers to marketing.

- **Worker Cooperative:** A worker cooperative or producer cooperative is a cooperative that is owned and democratically controlled by its worker-owners. But in India there is a form of workers cooperative which insists on compulsory membership for all employees and compulsory employment for all members.
- **Volunteer Cooperative:** A volunteer cooperative is a cooperative that is run by and for a network of volunteers for the benefit of a defined membership or the general public to achieve some goal, depending on the structure, it may be a collective or mutual organization which is operated according to the principles of cooperative governance.
- **Social Cooperative:** -Particularly successful forms of multi-stakeholder cooperative bring together providers and beneficiaries of a social service as members. Voting is one person one vote
- **Consumers' Cooperative:** -a consumers' cooperative is a business owned by its customers, employees can also generally become members, members vote on major decisions and elect the board of directors from among their own number.
- **Business and employment cooperative:** -are subsets of worker cooperatives that represent a new approach to providing support to the creation of new businesses.
- **New generation Cooperative:** Are an adaptation of traditional cooperative structures to modern capital-intensive industries.
- **Agricultural cooperative:** Agricultural cooperatives or farmers' cooperatives are cooperatives where farmers pool their resources for mutual economic benefit Wikipedia, (2016).

2-2-6. Successful models of some agricultural cooperatives:

Agriculture farming, forestry, fisheries and livestock is the main source of employment and income in rural areas. Agricultural cooperatives play an important role in supporting small agricultural producers. They empower their members economically and socially and create sustainable rural employment through business models. Cooperatives offer small agricultural producers opportunities and a wide range of services, including improved access to markets, natural resources, information, communications, technologies, credit, training and warehouses. They also facilitate smallholder producers participation in decision-making at all levels. Support them in securing land-use rights and negotiate better terms for engagement in contract farming and lower prices for agricultural inputs such as seeds, fertilizer and equipment. Through this support and play a greater role in meeting the growing demand for food on local, national and international markets FAO, (2012).

Some of the problems faced by agricultural cooperatives have been among others poor management, lack of capital resources, inadequate training, extension and education programmes, lack of communication and participation among members, feudalistic characteristics of society, unclear and inadequate government policies on the development of agricultural cooperatives, high fragmentation of land holdings, and weak linkages among the activities of the cooperatives e.g. production, credit, marketing etc. To overcome such problems, of the measures taken by the governments and movements have been, re-assessment and improvement of farm policies, human resource development through formal and informal training of members, Daman, (2003)

This training can be done by the agricultural agents within the agricultural extension activities.

2-2-6 -1. Agricultural cooperatives in Egypt:

Cooperatives in most parts of Africa are state instituted and state organized bodies Cooperatives and consequently cooperative members were a hit target of the liberalization process in the agricultural sector of Egypt.

Cooperative movement in developing countries is in a cross roads. The last two decades of the 20th. Centaury which witnessed the implementation of Structural Adjustment Programs, has also witnessed an accelerated decay in role of cooperatives movement in economies of most countries, especially cooperatives of the agricultural sector. Although the existing cooperatives may be the product of the government initiative rather than genuine associations created by their members, they may still provide a potentially effective framework for development intervention. Among reasons of that feeble condition is the absence of policy reforms that would assist cooperative to transform from being component of the public domain into an economic enterprise with full freedom to operate without undue restrictions on their management and activities. The cooperative movement in Egypt is among the oldest in the developing countries. A swift review of the cooperative movement shows emerging popular initiatives when the first was established in 1909. The Cooperatives, especially the agricultural ones, were used as a parastatal instrument during the 1960 and 1970 for implementing the country's development policies. This period was marked by over-promotion of the state. Soon after a slow transition to the acquisition of Structural Adjustment Programs, the cooperatives fell into steady state negligence the apex of cooperative structure in Egypt is the General

Cooperation Union (GCU). The structure involves the membership of five main federations which are Agriculture, Fishery, Housing, Consumer, and Production Abdel Aal, (2007).

The agricultural cooperation is the largest sector. It involves over 5,000 primary multipurpose cooperatives divided in 4263 credit cooperatives and this number almost equals the number of villages in the valley and delta. There are also over 600 cooperatives in areas are farmers benefited from the land reform laws. In addition to 571 cooperatives formed in reclaimed areas in the desert in Egypt 4 million farmers earn their income through cooperative membership Ruete, (2014).

- ✓ **Role of agricultural extension service in Egypt:** The Agricultural Extension Service in Egypt transfers the agricultural information primarily to the public sector with a small private sector component. Presently, the public sector Extension system is in a transitional phase in Egypt. The Extension system is moving towards decentralization of programming decisions and operations. Above all the Extension service of the country not only focuses on agricultural performance but is also involved in community development initiatives The Extension system plays a very significant role in enhancing agricultural production in Egypt Abdel Aal, (2007).

At present, the replacement of old practices with the new modern scientific farming technologies presents the main challenge for Extension. Despite, its good work on occasions, it is constrained by several issues and problems. The Agriculture extension services is the government agency belongs to Ministry of Agriculture. Many agricultural extension services could also be found in many non-governmental organizations (NGOs), Role of extension service therefore include; act as an intermediary or go between or even link between agricultural development institutions such as research institutes,

universities, colleges of agriculture and target groups which may be the farmer, women group, youths etc.

Agricultural extension policies, links the farmer with sources of farming inputs and credit facilities, provide the timely information on new innovations and practices meaningful agricultural development, provides educational services to farmers, and plays active role in the rural community development.

There is a strong link between Agricultural Extension, Agricultural Research and Agricultural Education in Egypt (Ibd).

2-2-6 -2. Agricultural cooperatives in Japan:

The phenomenal rise of the Japanese post-War economy can safely be attributed to the hard and systematic work done by these agricultural cooperatives (called JA or JA Group or even JA Movement) in consolidating people, land resources, producing the needed food and providing the needed services to the community. The JAs are a good example of an integrated framework in the service of the farmers. They deliver multipurpose services and operate as multi-function economic institutions directly responding to the felt-needs of the members. They serve the members at the same time being under the control of the members. Their services range from the ‘Cradle to the Grave’. This slogan has presently been pushed into the background mainly due to the economic capabilities and capacities already achieved by the agricultural cooperatives. The fact however remains alive because the organizational structure and the system still firmly exists and has been integrated in the services provided. The Japanese agricultural cooperatives stand committed to “3-H Agriculture Healthy, High Quality and High Technology. The Japanese Agricultural Cooperative Movement

had successfully introduced a number of innovations which are of great relevance to the Movements in the Region. Some of the interesting features of the agricultural cooperatives have been Sustained and progressive amalgamation of cooperatives to make them more economically-viable and service-oriented. Farm guidance and better living services to achieve a high degree of communication with the members and to enrich their economic and social life. Protection of interests of farmer-members through mutual insurance, health-care; Carefully planned and well-executed marketing and supply functions through specially-created and cooperative-owned holding companies; Production of quality consumer goods and services; Implementation of the joint use concept e.g. joint marketing, joint purchasing, joint-use of capital, joint use of facilities etc. Successfully interacting with the government through a process of policy dialogue and lobbying inside and outside legislature. Education and training of farmer-members through a network of cooperative training institutions, ensuring higher economic returns to the farmer members through a process of value-addition, encouraging women and youth to form associations to compliment and supplement the work of agricultural cooperatives especially in taking care of and sustaining the interest of the young and the aged in the honored profession of farming, encouraging the farmer members in controlling pollution to produce and market the healthy safe and nourishing agricultural products to safeguard the interests of consumers and Extending technical collaboration and cooperation to the developing Movements Prakash, (2003).

✓ **Agricultural extension service in Japan:**

Extension work in Japan was first started by farmer's organizations and later it was taken up by government before the Second World War, the cooperatives used to be the main agency for agricultural extension. They employed the agricultural expert who worked directly under village cooperative. He looked after most of the needs of the farmers. After the world war, an agricultural extension organization on the American pattern has been introduced in 1948.

Three principles followed in extension organization are:-

- ✓ A complete separation of the regulatory and service duties from the educational aspects of extension.
- ✓ Giving prominence to the Home Improvement
- ✓ Joint financing by the National and Provincial governments.

The Extension division coordinates the work of prefectures Prefectural level. Responsible for the planning, training and appointment of the local advisers Supply of equipment, plans for extension work and deals with administrative matters of local functionaries They belong to one of the 23 special fields like rice, soil, livestock, etc., they are the link between the farmers, farm advisors and research stations. Extension work in Japan Is organized for what is called area. An area consists of about 3,000 families the local staff assists and guides the farmers in farm management and all aspects of home economy. The village local leaders are selected to be the promoters of the extension work.

Since the national government does not directly offer extension services, agricultural research-extension linkage in Japan operates at the prefecture level. It is a bottom-up management system in which decisions on linkage

activities are taken at prefecture level without the direct involvement of national officers. Research–extension linkage involves the use of subject-matter specialists, technical committees, joint study meetings, and staff exchanges between prefectural research and extension organizations. Farmers’ problems and needs are compulsorily sourced by district extension centers from farmers, agro-cooperative societies. The formulation of extension information activities by using computers has been more important efficient and effective. In order to improve the situations, Japan Agricultural Development and Extension Association (JADEA) established the system that could share information by most extension advisors. One function of the systems is to collect the case Information of Extension Activities (Ibd).

2-2-6 -3. Agricultural cooperatives in India:

India has basically an agrarian economy with 72% of its total population residing in rural areas. The rural people need lot of services in daily life which are met by village co-operative societies. The seeds of cooperation in India were sown in 1904 when the first Cooperative Societies Act was passed. Since then the cooperative movement has made significant progress. Cooperatives have extended across the entire country and there are currently an estimated 230 million members nationwide. The cooperative credit system of India has the largest network in the world and cooperatives have advanced more credit in the Indian agricultural sector than commercial banks. The village cooperative societies provide strategic inputs for the agricultural sector, consumer societies meet their consumption requirements at concessional rates; marketing societies help the farmer to get remunerative prices and co-operative processing units help in value

additions to the raw products etc. In addition, co-operative societies are helping in building up of storage go-downs including cold storages, rural roads and in providing facilities like irrigation, electricity, transport, and health. Various development activities in agriculture, small industry marketing, and processing, distribution and supplies are now carried on through cooperatives, in fertilizer production and distribution the Indian Farmers Fertilizer Cooperative. In the production of sugar, the cooperative share of the market is over 58 percent and, in the marketing, and distribution of cotton, they have a share of around 60 percent. The cooperative sector accounts for 55 percent of the looms in the hand-weaving sector. Cooperatives process, market and distribute 50 percent of edible oils. Dairy cooperatives operating under the leadership of the National Dairy Development Board and through 15 state cooperative milk-marketing federations has now become the largest producer of milk in the world. The groundwork for this was laid in the early 1970's when the largest dairy development programme in the world - Operation Flood – was launched. Operation Flood was a national marketing strategy linked to a dairy infrastructure development programme that potential of cooperatives remains untapped. The Indian Farmers Fertilizer Cooperative created a chain of dairy processing plants, collection stations and a national milk transportation grid. With the passage of the Insurance Act, cooperatives have been allowed to entry into the insurance business. Insurance is a field where the immense has recently teamed up with a Japanese company and formed a joint venture for undertaking general insurance business in India. This signifies that Indian cooperatives have come of age in formulating strategic alliances. Thus, the co-operative societies in India in fact are playing multi-functional roles both in rural and urban areas. An Expert Group constituted

by the Government of India in 1990, recommended to facilitate building up of integrated co operative structure; to make the co-operative federation organizations responsive towards their members; to minimize government interference and control in the functioning of co-operatives and to eliminate politicization from the cooperative sector. Based on the recommendations, the central government enacted the Multi State Cooperative Societies Act, (2002) that provided for democratic and autonomous working of the Cooperatives, which came into force with effect from August 19, 2002. Various development activities in agriculture, small industry marketing and processing, distribution and supplies are now carried on through co-operatives. The co-operatives in India have made an all-round progress and their role in, and contribution to agricultural progress has particularly been significant Singh (2016).

✓ **Agricultural Extension in India:**

Service education in agricultural extension may be obtained at any of the spread across India. Also, facilities for in-service training of extension staff are available at many institutions such as Agriculture Extension Division, the Department of Agriculture and Cooperation, and the Department of Agricultural Research and Education, both under the Ministry of Agriculture. Certain well-established NGOs, public agricultural universities and research institutes like the Indian Agricultural Research Institute, and some private agricultural companies can also organize in-service training courses for the extension staff under mutually agreed arrangements.

Radio and television programs for farmers have been broadcast. India has made impressive progress in the application of ICT to its rural and agricultural development programs. Dozens of agricultural commodities

focused and technical discipline based public and private IT networks exist, with many of them reaching the village level, Saroj Kumar, (2016).

2-2-6 -4. Agricultural cooperatives in China:

Cooperative organizations are not new phenomena in China. Their history dates back to the beginning of the twentieth century. Since the late 1990s, the number of farmer cooperatives in China has rapidly grown, Yamei Hu, (2005).

The adoption of the national law on farmer professional cooperatives in 2007 has led to significant governmental support for the establishment and management of farmer professional cooperatives World Bank, (2006).

Economic collective-action organizations can help small farmers to pool resources in order to access the specific assets needed for production, achieve economies of scale or scope, and gain bargaining power to negotiate with buyers. In addition, producer organizations can provide technical assistance to their members, make available market information, and help their members in storing and transporting perishable products. In other words, producer organizations can reduce the transaction costs that are often problematic for small farmers when they want to participate in high quality value chains. A number of authors have found that producer organizations, producer groups, or cooperatives facilitate small farmer participation in high-value supply chains, particularly in fresh produce market. In China, for a long time economic producer organizations were almost absent. Since the centrally planned marketing system for agricultural products was abolished in the 1980s, most farmers have been selling their products to small traders and small wholesalers. This is still the dominant situation for marketing of fruits and vegetables in most of rural China. While farmer marketing

cooperatives started to appear in some parts of China in the late 1990s, due to local government initiatives to promote collective marketing, their number began to increase nation-wide only after the introduction of the 2007 law on promotion of farmer cooperatives. This law has the explicit objective of strengthening the rural economy by supporting the establishment of marketing cooperatives. Such cooperatives can link small farmers to traders, processors, and retailers downstream in the value chain, including modern value chains catering to high-quality markets. In addition, these cooperatives can provide farmers with bargaining power in increasingly concentrated food markets. In China the initiative to establish a cooperative comes from one or more entrepreneurial persons with access to the financial capital, the human capital, and the social capital needed to establish a successful marketing organizations. These entrepreneurs can be farmers, or they can be traders, extension officers, or managers of a processing company as one of the goals of state support for cooperatives is to establish linkages between farmer cooperatives and supermarkets, quality issues are crucial. Supermarkets generally have higher quality requirements than other market outlets .While supermarkets have been rapidly rising in China. J OS BIJMAN, (2011).

✓ **China Agricultural Extension:**

The China Agriculture Extension Special programme is an initiative that supports extension practitioners and farmers in China to set up profit-sharing schemes to improve agricultural productivity, enlarge market access, and promote rural enterprise development. It innovatively seeks to reform the traditional supply-driven government efforts in agriculture extension and introduce demand-driven and market oriented mechanisms to link farmers

more directly to improved technology, new business models and product markets. Selim Jahan, (2011).

2-3. Development of agricultural cooperatives in Sudan:

The development challenges facing Sudan are numerous, but at the heart of the problem is how to continue and accelerate economic growth, and correspondingly how to translate this into improved employment opportunities for the vast majority of the country's population. Skills enhancement for more women and men can help countries move to a virtuous circle of higher productivity, people's employment, income growth and development. Ibrahim, (2013).

The fact that agriculture is the main source of development but problem is that the agricultural sector to date has largely focused on production alone rather than acknowledging that agriculture is multifunctional and also provides economic, environmental and social services. New York, (2008).

In Sudan, there is an increasing emphasis on the role that agricultural cooperatives can play in the development of the agricultural sector. This is reflected in the government policy of establishing new agricultural cooperatives, rehabilitation of the existing ones, and the conversion of some of the government agricultural schemes to agricultural cooperatives owned by farmers. Ministry of Finance and Economic Planning, this increasing interest in agricultural cooperatives in Sudan in particular and in Third-World countries in general Muneer, (1989).

Cooperatives are based on values of self-help, self-responsibility, democracy, equality, equity and solidarity. While cooperatives are also businesses, the main objectives for people to set up or join a cooperative is

to improve their economic and social conditions through joint action for the good of all members (Ibd).

The history and importance of agricultural cooperative organizations in Sudan is a long-standing one. The first beginnings of the Sudanese cooperative movement were agricultural, Al-Otaibi, (2007).

2-3-1.Models of some agricultural cooperatives in Sudan:

2-3-1-1. Abu Zemam Agricultural Society

Abu Zemam Agricultural Society is one of the cooperative societies in the Al Jazeera scheme - Cap al-Jadad office - west of the Aljadeed el thawra, it was established in 1990.

A member of the Association about 42 members all of them were agronomist, the share capital of members it was an agricultural areas in addition to material contributions.

The administrative structure of the association consists of:

Director's administrative work within the association and the advisory council has the mission to communicate with other relevant bodies to determine the basic needs of the association.

The budget is prepared every year and submitted to the National Council of Cooperatives to acceptance.

At the beginning of the established association, it was successes full for providing members and the local community in the area; it provided them in their daily lives needs.

As a result of Ministry of Agriculture policies which was took a large area from the association land which was reduced production

The members have not been trained and there was no agricultural extension work in association.

The most common constraint it's financing that assisting members to achieve a high productivity, Hanna (2019).

2-3-1-2. Abu Halima Co-operative Society:

It was established on the first of January (2011) it is located in the Abu Halima area, in Khartoum Bahri, it is work the Greenhouses each greenhouse are consisting of five halls; each hall has five houses, the total greenhouses 125 houses for 125 members the total of members 125 members.

The main crops: Tomatoes, cucumbers, peppers, and broccoli it achieved great successes in cultivating these crops, where the productivity reached five tons of tomatoes per day, seven tons of cucumbers and two tons of peppers, feeding all the markets of Khartoum State, Khartoum, Omdurman, and Khartoum north. It has warehouses for cooling production (coolers).

Production is organized into three types, first-class to the supermarket, second class to banks, and third class to local markets in Khartoum state. It has three cars for carrying and distribution production.

30 members were trained in entrepreneurship; it has a Turkish expert in the field of greenhouses, Technical manager - supervisors to follow, Regular meetings for evaluation and implementation, Hamza (2019).

2-3-1-3. Al-Doum Cooperative Society:

The cooperative was established after the May revolution (1969) as the nationalization of the spread of a culture of agricultural cooperation, and consumption by the Minister of Agriculture, Abu al-Gasim Hashem and Abu al- Gasim Muhammad Ibrahim.

The cooperative started with **72** shares of farmers on about **550** acres west of the residential villages, and it was proposed to extend it to the east of the railway.

The cooperative supplied the capital, Khartoum - Al-Jazeera, and Dongola - with vegetables and fruits before the dissemination of agricultural skills, by low prices, simple profits. For avoiding strong competition

Agricultural production has shifted to growing fruits, lemons, forages and raising and fattening livestock.

The cooperative has floating barges to avoid the retreat of the Nile, with a floating pump, Irrigation system with control doors and generators but The association now needs to clean the canals, financing banks, progressing the cooperation law and needs internal laws of cooperation to reassert its position and its authority in its own domain to meet all the needs of the cooperative member even after his death.

The cooperative needs a direct selling for their productions in the central market, to be sold at prices lower than those in the other's markets.

The Cooperative President and the Board of the Administration are elected by the members of the Association of Cooperatives (General Assembly).

This is one of the general principles of global cooperative, democratic management. Babiker (2019).

2-4. Role of farmer's Cooperatives in Agricultural Development:

Cooperatives are present in all the countries and in almost all the sectors, including agriculture, food, finance, health care, marketing, insurance & credit. A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. Agriculture continues to be the engine of economic growth in most developing countries. Strong cooperatives are able to overcome many of the difficulties faced by the farmers; wherein in a country like India 85% are small and marginal farmers. Cooperatives work on the set seven

principles, among these principles the seventh principle - Concern for the community derives cooperatives to work for the sustainable development of the community, Virendra Kumar, (2015).

The law of cooperative was released in 1948 then 1949 established the first irrigation cooperative in the northern state as economical system cooperative There have been many types of traditional cooperatives (Nafir, Faza, and Sanduk e.g.) that aimed at organizing people to help each other during times of hardship or need Agricultural cooperatives in the modern sense started in the 1930, EI Tayeb, (1989).

2-4-1.Agricultural Extension Activities in Cooperatives

Agricultural extension is among the most important policy instruments that governments can use in agricultural development thus contributing to agricultural productivity and farm incomes increase and quality of life improvement in rural areas. The history of agriculture extension and agricultural technology transfer started in Sudan at the time of establishing the research centers in 1902, with the establishment of experimental cotton farms.

Extension services in Sudan are almost entirely public. Main extension services providers are the Ministry of Agriculture and the Ministry of Animal Resources and Fisheries, Its main activities include farmer-oriented activities (training, demonstrations, exposure visits, group mobilization and capacity building) and information dissemination .Salim, (2016)

The Agricultural Extension Service has played a major role in educating farmers in the region and provided them with modern technologies to increase production and productivity through training courses, Modernization of the adoption of agricultural innovations to increase the

production and productivity of the loan to improve the economic situation and self-sufficiency and increase the local and national economy. Ballh, (2012)

2-5. Wad Ramli Agricultural Cooperative:

The rural people need lot of services in daily life which are met by village co-operative societies. Because, co-operative societies are helping in building up of rural roads and in providing facilities like irrigation, electricity, transport, and health, Various development activities in agriculture, small industry marketing.

Cooperation society it is a unit with a specific, class or specialist activity, aiming at realizing general principles of cooperation.

Cooperation movement: a united popular consulting movement that is performing its social and economic activities in accordance with country policies and regulations, with support and guidance provided by the state.

Cooperation society: a popular group represents a socioeconomic assembly paying attention to the principles, plans and methods of cooperation considering the means for social justice, it is rather represented by people who have related direct benefit in Wad Ramli village, and the field of activity aims at raising the members' social and economic situation and upon such principles, Wad Ramli agricultural cooperative society was established in 1949 as the first agricultural cooperative society in Sudan and registered dated July 19, 1949 under number 1 composing of 99 members who paid a capital amounting to 495 Sudanese pounds, five pounds for each share, the project was established on an area of 1965 acres. The society continued its activities till 1965, stopped and initiated its activities again in 1969 on the same area and 500 members after it was allowed to have additional members. The society production increased within the seventies and eighties

where it was produced about 75% from banana needed by Khartoum state in addition, the society exported some vegetables abroad such as peppery, green bean. it became famous locally and internationally where it was visited by people from inside and outside Sudan. in 1992, a governmental resolution promulgated to raise the membership to 1200 and 5200 acres which is the current area, only from which 3500 acres are invested.

2-5-1. the most important crops in Wad Ramli:

Onions, tomato, faba bean, banana, potato wheat, and some important and widely grown fodder and rotational crops like clovers, feed of sorghum (Sudan grass).

2-5-2. Wad Ramli Agricultural cooperative Services:

The cooperative plays vital economic and social roles that are necessary to develop the area, for example, before the establishment of cooperative, citizens were distributed in different areas of Sudan searching for work such the White Nile, Blue Nile, Northern area. But after established the cooperative, they returned back to their countries for agriculture, the matter contributes to the stability and improvement of their social and economic situations.

Previously, they used gasoline pumps from 1970 to 1975, then the cooperative conducted electricity, which provided the citizen with electricity service in their homes, the matter causes major social and cultural boom when electric appliances widely used.

The cooperative, in the field of development, specified 2% of its yearly income to develop the area, where it participates in the building of the area schools (two elementary schools and two high schools, it participated in the building of the agricultural counseling unit, contributed to the execution of Al-Radmia road, which is connected to the highway. it supported the area

health center and participated in the building of 4 mosques. the cooperative has a main role in the stability of livestock owners by providing them with the drinking water and fodder and farms.

from the economic side, the cooperative provides the productivity inputs, making crop rotations, the matter enables farmers to cultivate their lands, the matter increases production and in turn improving their economic and family situation. the society provides work opportunities for many of the area individuals (employees and laborers) to increase their income and improve their economic and social status realizing the cooperation principles.

Agricultural extension activities in wad ramli agricultural cooperation society:

Wad Ramli agricultural cooperative, in the field of agricultural counseling, it is the unique cooperative employing in its board of directors an agricultural extension agent from the department of agricultural extension and technology transfer, therefore it contributes to the building of the area agricultural extension in addition to putting many extension programs that improved production, that the cooperative has agricultural extension school of 25 farmers who are weekly meeting to discuss one of the subjects that aim at improving productivity, one of this school session is contributed by minister of agriculture and a team from the agricultural researchers, Professor Jaafar Mohammed Al-Hassan, faculty of agriculture, Khartoum University. The society adopted the execution of Haloc control program of the vegetable crops, this in consolidation with department of agricultural extension and agricultural researches authority to hold field days, workshops and execute the research recommendations to execute the crop rotation to get rid of Haloc after major of area is missed in the previous season of tomato, the program of which has succeed in the ratio of 90%. The cooperative

executed the biofertilizer program in the faba bean and clover in consolidation with the department of agricultural extension and environment research center to increase production and decrease costs.

with agricultural extension administration in 2002 – 2003, the cooperative adopted the program for developing potato through establishing graphic field to reveal the difference of production between three categories (alfa, draga, dynmont) and between the method to cut tubers prepared for cultivation, and on the harvest day, ,a field day established to ensure the results shared by more than 100 farmers and the ministry of agriculture Khartoum state under supervisory of the minister and state potato production committee represented by Dr. Saif Eldeen Mohammed Al-Amin from Sudan University and Dr. Siddiq Mohammed Al-Hassan, faculty of agriculture, University of Khartoum, then it provides student from University of Khartoum to make their experiments for their dissertations of Master and PhD. degrees under supervisory of Dr. Abdul-Wahab Abdullah/ crop productions section, faculty of agriculture, and established an exhibition containing its products at the Sudan University on the farmers' day.

for irrigation, the society has the main irrigation source with electric 4 pumps size 24 inches on the Nile, in addition to 3 gasoline-operated pumps till 2004, When onion seeds (Bafteim) discovered in Sudan, a heuristic field was executed on the society land, the extension area in 2004 – 2005 in 2 acres area, the production was 300 bags/acre, this field day was attended by the state minister of agriculture Dr. Faisal Hassan Ibrahim, where the minister conducted the pump's electricity. In 2008 -2009 season, the society extension unit cultivated the medical perfume plants under cooperation by the Arab Organization for Agricultural Development to realize the following objectives:

1. To increase the producer's income and improve their living conditions through Cash crops.
2. urge to cultivate medical perfume plants
3. use modern techniques and have framers acquainted with such techniques
4. develop the harvest and post -harvest processes
5. provide seeds
6. contribute to meet the local market needs
7. export products outside the country
8. contribute to spread and develop the medical plant in the Sudan

The projected began in 2008 cultivating the crops: chamomile, fennel, ammi, black latency, fenugreek, lepedium on an area of 18 acres which is widely succeeded, the production of which is marketed to wholesalers and a part of which is bought to the Arabic company, and a part of which is exported to Egypt- khallet for medicine factories. Ballah, (2010)

CHAPTER THREE

METHODOLOGY

3. Study design:

A social survey method was used to assess the Impact of Agricultural Extension activities on the performance of Agricultural Cooperative members.

3.1 Area of Study:

This study was conducted in the northern part of Khartoum state Wad Ramli Agricultural Cooperative. In Wad Ramli village; witch located in the Khartoum North (Bahri).Its geographical coordinates are 16° 6' 11" North, 32° 34' 10" East and the climate is desert climate, rainfall is About 94 mm annually and the average annual temperature is 29.0 °C. June is the warmest month and January is the coldest month of the year. (Mindat.org 2-19).Its original name Hillat Wad Ramli It is located on the east bank of River Nile and characterized by agriculture and animal husbandry. The total of its agricultural lands with irrigation channels is 3250 acres. The number of shareholders is 1200 farmers; (members) in cooperative each share 5.2 acres.

Wad Ramli agricultural cooperation society was established in 1949 as the first agricultural cooperative society in Sudan and registered dated July 19, 1949, and has been operating its social activities until now

The most important crops Onions, tomato, faba bean, banana, potato wheat, and some important and widely grown fodder and rotational crops like clovers, forage. **More details Appendix No 1**

3.2 Study population:

The research community represents the number of members of wad Ramli Agricultural cooperative, which is working on a cooperatives project to raise productivity for small farmers.

3.3 Sample technique

Search was conducted on registered members in the association by choosing a simple random sampling technique used to implement the research, depending on the homogeneity of the research community. By using standard formal for determining sample size (Glenn, 2009)

3.4 Sample size:

The total number of the registered members in Wad Ramli agricultural cooperative is (1200) members

The formula:

$$1) \quad SS = Z^2 \times p \times (1-p)/M^2$$

Where:

SS = Sample Size for infinite population

Z = Z value (e.g. 1.96 for 95% confidence level)

P = population proportion (expressed as decimal) (assumed to be 0.5 (50%))

M = Margin of Error at 5% (0.05)

After calculation of sample size you have to correct for the total (estimated) population

$$2). \quad SS \text{ adjusted} = (SS) / (1 + [(SS - 1) / \text{population}])$$

$$1). \quad (1.96)^2 \times 0.5(1-0.5) / (0.05)^2 = 384.2$$

$$2). \quad 384.2 / (1 + [(384.2-1) / 1200]) = 292 \text{ Respondents.}$$

3.5. Methods of Data Collection:

Primary data were collected from members of Agricultural cooperative using structured questionnaire.

The secondary data were obtained from secondary sources such as documents of the study regional; it also obtained from documents analysis. It was undertaken using in-depth review of related literature from the Internet and up-to-date extension service challenges reports of Wad Ramli Agricultural Extension office. Published articles and books, reports from government and non-government organizations, archives of stakeholders' organizations and some media reports (print and electronic) were also explored

Quantitative data were collected using a questionnaire. The questionnaire was distributed by the researcher and delivered randomly to the sample members according to their categories by hand. The researcher obtained 292 valid questionnaires to conduct the statistical study.

The research relied on the questionnaire as a primary tool for obtaining primary information.

The research questionnaire composed of the following sections:

1. **Part one:** demographic data : Age, educational level, and Social status
2. **Part two:** agricultural extension service, activities, training and courses.
3. **Part three:** attitude and Knowledge of members in agricultural cooperatives.

Secondary data

3.8 Data Analysis:

The field data was analyzed by computer based on the statistical package for social sciences program, (SPSS version 20) in order to describe the personal characteristics of the community through the sample taken; by using frequency and percentages, and test the research hypotheses through the following.

. **Chi- Square Test:** this test measures the extent or absence of a statistical relationship between two statistical variables, it measure the association between 2 variable .

It measures the relationship between the agricultural extension activities, services and the increase income.

.**The Likert Scale:** The use of this test is to measure the attitude of the research community towards the agricultural activities, services and the principles the cooperatives.

The overall response score for the variables was measured on 4-point Likert scale, a method which is now one of the dominant in measuring people's attitudes, views and experiences (Taylor and Heath, 1996). The respondents rated the statements based on scores ranging from a maximum of 4 to a minimum of 1, whereby strongly Agree =4, Agree = 3, Disagree =2 and Strongly Disagree = 1.

The main reasons for choosing a four-point Likert scale were that it was considered sufficiently detailed for the purposes of the main research, in order to prevent respondents simply selecting the middle answer, while still providing a good number of possible answers to choose between in order to facilitate the respondents' distinctions between these.

Table No. (1) shows the measure of degree of agree

degree of agree	Rank
strongly Agree	4
Agree	3
Disagree	2
Strongly Disagree	1

Table No. (2) Shows the weight of the attitude

the measure	strongly Agree	Agree	Disagree	Strongly Disagree
Mean	Complete satisfaction	satisfaction	dissatisfaction	Complete dissatisfaction
weight	4	3	2	1

Chapter four

Results and Discussion

4.1: Demographic characteristic

Table 4-1 frequency distribution and percentage of the respondents' according to their age

Age (years)	Frequency	Percent	
20- 30	71	24.3	73.3
31- 40	48	16.5	
41-50	95	32.5	
50 and above	78	26.7	
Total	292	100.0	

(Social Survey, 2019)

Table 1 shows that 73.3% of respondents within the age of 20-50 years which is the economically age within which the farmer can deliver in the field, similar study by Yamusa et al, (2014) revealed that all the respondents falling above 50 years old are still in their productive and active capacity.

16.5% of respondents within the age of 31- 40 this means that a large percentage of youth leaving agricultural to other activities which require the intensity of extension activities for the importance of agricultural cooperative. The extension agents must give attention to member relations as well as strictly business activities.

4.2: Educational level:

Table 4-2 frequency distribution and percentage of the respondents according to the Educational level

Educational level	Frequency	Percent
Illiterate	60	20.5
Khalwa	55	18.8
Basic	35	12.0
Intermediate	47	16.1
Secondary	70	24.0
University &Post graduate	25	8.6
Total	292	100.0

(Social Survey, 2019)

Table 2 revealed that only 20.5% of the respondents are illiterate, 18.8% are Khalwa. The literacy level of farmers is appreciably high considering the sum of, Basic, primary, secondary education, however, only 8.6% of respondents had a university education and above, This indicated that the education services among the members of the association are high, to enhance the awareness of the members. Chambo, et al (2007) in similar study conduct in Nigeria revealed the educational level plays an important role in the adoption of new and innovative production methods and undertaking risks.

It is essentially an indication that farmers with more experience would likely adopt innovative ideas and techniques that would enhance an increase their agricultural productivity.

4.3: marital status:

Table 4-3 frequency and percentage of the respondents according to the social status:

Social status	Frequency	Percent
Married	165	56.5
Single	87	29.8
Widowed	34	11.6
Divorced	6	2.1
Total	292	100.0

(Social Survey, 2019)

Table 3 the marital status of the respondents revealed that 56.5% of them are married hence had family responsibility; this indicates that the rate of family stability in the community more than half, this confirms that the divorce rate is very low 2.1%, also the Single people 29.8%.

This high percentage requires team works with young people to get stability, according to national experience; this work was done by cooperatives in most countries.

2: The activities and services of agricultural extension

Table 4-4 frequency distribution and percentage of the respondents according to their knowledge about agricultural extension office in the area

Agricultural extension office in the area?	Frequency	Percent
Yes, I have	291	99.7
No, haven't	1	.3
Total	292	100.0

(Social Survey, 2019)

Table 4 means that 99.7% of members have knowledge about the agricultural extension office in the area. This indicates that there is a contact between agricultural extensions and cooperative members in the area. Indeed, the effectiveness of the extension agent can often determine the success or failure of an agricultural extension programme, An extension agent tries to arouse people to recognize and take an interest in their problems, to overcome these problems, and teach them how to do so, to persuade them to act on his teaching, so that they ultimately achieve a sense of satisfaction and pride in their achievements.

Table 4-5: Frequency distributions and percentage of the respondents according to participation in agricultural extension activities.

Activities	participated		not participated	
	Frequency	%	Frequency	%
Farmers field school	286	97.9	6	2.1
Demonstration fields	288	98.6	4	1.4
Field and office visits	288	98.6	4	1.4
Training& sources	288	98.6	4	1.4
Extension message	287	98.3	5	1.7

(Social Survey, 2019)

Table 5 indicated that there were yearly extension activities provided by agricultural extension agents according to the programme of the Ministry of Agriculture in Khartoum State.

The researcher found that these activities were presented in different ways, 97.9% of members participate in Farmer's field schools, and 98.6% of members participate in training courses, this indicates that there is a relationship between cooperative agricultural extension agents, which can help cooperative members,(One important co-operative principle says that , cooperation among cooperative) this result agree with a similar study conducted in Kenya the government extension is a major source of information in all the communities investigated. David Ree- et al (2000).

Table (4-6) Frequency distribution and percentage of the respondents according to the service they received.

service or programs	provided		not provided	
	Frequency	%	Frequency	%
Farm management.	252	86.3	40	13.7
Provide input.	268	91.8	24	1.4
Provision of credit.	256	87.7	36	12.3
Marketing services& information	163	55.8	129	44.2
advance technologies.	215	73.6	77	26.4

(Social Survey, 2019)

Table 6 showed that 44.2% of the members were not provided with marketing services, lack of marketing information service leads to poor performance of members.

The researcher believes that the market information is one of the most important services that can be provided by the Agricultural Extension agents for the farmers to increase their production and productivity according to the marketing information.

this study agree with study conducted by food and agriculture organization of the United Nations, (2017) which said that the use of market information for longer-term decisions, farmers should be aware of their storage costs, to decide whether to store or not; in addition, they should have an understanding of the production costs, so that they can use Management Information Systems (MIS) to plan whether to grow new crops or to move to off-season production.

Farm Radio International (2003) has produced a series of radio programmes, in the form of plays, to help farmers understand marketing; the first installment of the series discusses how to use market information.

Table (4-7) frequency distribution and percentage of the respondents according to their opinion to the services that increased their income

Members opinion	Frequency	Percent
Not Increase.	79	27.1
Increase to some extent.	129	44.2
Increase.	79	27.1
More Increase.	5	1.7
Total.	292	100.0

(Social Survey, 2019)

The result shows that **73.1%** of the respondents their income Increases according to Services that provided by the agricultural extension agents, this may confirmed the importance of marketing information provided to farmers by the agricultural extension Services.

3: The extension Courses & training

Table (4-8) frequency distribution and percentage of the respondents according to the agricultural extension courses provided

Extension courses attendance	Frequency	Percent
Attended	148	50.7
Not attend	144	49.3
Total	292	100.0

(Social Survey, 2019)

The study clearly shows that 50.7% of the respondents have received extension courses from the agricultural extension agents in the area, and 49.3 have not received extension courses (Table (4-8))

These courses helped farmers to adopt innovative ideas and techniques in their farms. So these courses showed the importance of training and rehabilitation in the performance of farmers. Training for farmers has been

proven to yield variety of results. Murshed-E-Jahan and Pemsl (2011) in their studies on Bangladeshi small farmers concluded that building the capacity of farmers through training is more valuable than the provision of financial support in terms of raising production and income.

Similarly, a study by Tripp and Hiroshimil (2005) confirms the importance of training can contribute to enhancement of farmer’s skills in farming works. Studies on the effectiveness of training for farmers showed that not all programmers meet success as most failures of programmes in the developing countries were attributed to the tendency of excessively concentrating on a particular technology transfer rather than a broader the training programme in focus in this particular.

Table (4-9) Frequency distribution and percentage of the respondents according to the type of agricultural extension courses received

Courses or training	Frequency	Percent (%)
Agricultural extension	75	25.7
Association	65	22.3
Other mention	8	2.7
Not received	144	49.3
Total	292	100.0

(Social Survey, 2019)

Table 9 results indicate that 25.7% of the respondents have received extension courses of agricultural extension, 22.3% of the respondents have received courses of Association and only 2.7% have received others courses of (agricultural bank, Agricultural research, and NGOs).

The result shows that a large proportion of the farmers’ have received extension courses of the agricultural extension.

But the participation of the other was very weakly, Even though that the participation of others is one of the general principles of cooperatives.

3-1 The extension training

Table (4-10) Frequency distribution and percentage of the respondents according to the training field that members participated in

The training	Frequency	Percent
groups financing	24	8.2
group marketing	96	32.9
Post harvest transaction	172	58.9
Total	292	100.0

(Social Survey, 2019)

The training field that members participated in table 10 shows that 58.9% of the respondents have received training courses about Post-harvest transactions, 32.9% have received the training courses about group marketing, and only 8.2% were received training courses about group financing. Everybody learns to manage money but not everybody manages it well. So the financial training courses is importance for helping people to recognize the importance of regular saving and thoughtful expenditure; showing them how to calculate costs and profit margins and work out cash flow plans; now that more and more financial service providers are reaching down to the low income market and new technology is creating unprecedented opportunities for rural communities to access financial services.

Technical know-how is not enough. In order to be competitive and take advantage of the new opportunities that are arising farmers increasingly have to adapt their farm business to changes in the market and to improve efficiency, profitability, and income. In response to these changes, the Food and Agriculture Organization of the United Nations (FAO) has developed the concept of the Farm Business School (FBS) to build farmers' capacity in entrepreneurial and management skills, the Farm Business School enables farmers to learn and improve their knowledge, change their attitudes and

enhance their skills toward improved farm commercialization. The National Bank for Agriculture and Rural Development Mumbai (2015) stated that training also should cover management of the finances like maintenance of books of account, Management Information System, share capital, borrowings, savings, loans, cash flow, funds flow, receivables management, payables management, investments etc.

Table 4-11 Frequency distribution and percentage of the respondents according to their benefit from training courses

benefited	Frequency	Percent
Few	74	25.3
Medium	196	67.2
Great benefit	22	7.5
Total	292	100.0

(Social Survey, 2019)

Table 11 show the benefits of respondents from the training courses, most of them 67.1% are gain medium benefits; only 7.5%, were gained Great benefit that show the agricultural extension most improve the training content to increase members benefits so to increase their opportunities for crops marketing and economic Profits.

Services production provided by cooperative to the respondents

Table 4-12 Frequency distribution and percentage of the respondents according to production services which provides by society.

Services	provided		not provided	
	Frequency	%	Frequency	%
Provide Agricultural Inputs	262	89.7	30	10.3
Group Financing	242	82.9	50	17.1
Extension Services	268	91.8	24	8.2
Education to improve agricultural productivity	215	73.6	77	26.4
Group Marketing	152	52.1	140	47.9

(Social Survey, 2019)

Table 12 show that cooperative was provided Services production to developed their member's skills and knowledge necessary for the exercise of their profession, instilling in them a sense of the social importance of the work they are doing. Extension services 91.8% which indicates great needs of members to raising their productivities.

Table (4-13) Frequency and percentage of the respondents according to the Social Services that provided by Society

Services	provided		not provided	
	Frequency	%	Frequency	%
Academic Services.	225	77.1	67	22.9
Electricity Services.	226	77.4	66	22.6
Health Services.	227	77.7	65	22.3
Places of Worship.	223	76.4	69	23.6
Home Economic& Family Welfare.	186	63.7	106	36.3
Others	4	1.4	288	98.6

(Social Survey, 2019)

It can be seen in table (13) 77.7% Health services this indicate that the important of this services, which is provided more than others social services. Cooperatives, as the most important expression of citizens' needs and aspirations in the form of an enterprise, have appeared naturally to provide adequate solutions to satisfy community needs, such as health, education, housing, environment, social services.

To make this reality known, the International Organization of Industrial and Service Cooperatives (CICOPA), and the International Health Cooperative Organization (IHCO), are launching the campaign "Social needs, cooperative answers" following a workshop organized in South Africa in the framework of the International Cooperative Alliance conference in 2013 Up until 2020. International Cooperative Alliance (8 November 2014).

4: Likert scale

Table (4-14) Likert scale of the attitude of the respondents towards agricultural extension activities which provided to them

No	Items	Degree
1	Farmers field school	1.7
2	Demonstration fields	1.6
3	Field and office visits	1.8
4	Training and couriers	1.8
5	Extension message	1.8
	Likert Average scale	1.7

Statistical analysis (2019)

Table (14) shows the average level of Likert scale about attitude of members towards Wad Ramli Agricultural Cooperative agricultural activities represented in the terms, Farmer's field school, Demonstration fields, Field and office visits, training & courses, and extension messages. The table shows that the average Likert scale for agricultural extension activities was (1.7) degrees, Farmer's field school (1.6) degree, Demonstration fields (1.8) degree, Field and office visits (1.8)degree, Training and couriers (1.8) degree ,Extension message (1.8)degree, all of them are less than the level of likert scale average (1.7).That means the respondents are convinced that their attitude towards the extension activities provided to them is negative this indicated that farmers need to increase their information and needs more in these programs through these Activities.

4.4.2 Agricultural extension activities axis that helped on member's capacity building

Table (4-15) The Likert scale for measuring attitude of members towards Agricultural extension activities that helped them capacity building in cooperatives management

No	Items	Degree
1	To know how to management cooperative Society	2.6
2	Book keeping and accountants of the Association	2.5
3	Supervising and monitoring the activities of the society	2.8
4	Communication between Association Members	2.5
5	How to conduct periodic meeting for dissection	2.3
6	Report writing	1.9
	Liker scale	2.4

Statistical analysis (2019)

Table (15) shows the Likert scale about the attitudes of Wad Ramli Agricultural Cooperative members towards the extension activities represented in the terms of know-how to manage cooperative, Bookkeeping, accountant, Supervising and monitoring, Communication between Cooperative Members, How to conduct meetings, Report writing.

Agricultural extension activities were indicated a positive attitude of the Cooperative members toward the extension activities provided to them at a level of (2.4) degree, just one item is Report writing (1.9) less than (2), that means the respondents are convinced that the extension activities provided to them were satisfactory, this indicated the positive attitude toward the agricultural extension activities.

4.4. 3. Agricultural extension Services in marketing production axis:

Table (4-16) The Liker scale for measuring the attitude of respondents towards their benefits from agricultural extension Services in marketing production

No	Items	Degree
1	Business Facilities	2.4
2	Provide Data & Market viability study	2.3
3	Marketing Information	2.1
4	Provide Marketing Information in time	2.1
5	Entering Communication Technology	2.6
6	Transfer Agricultural Production& market it	2.9
7	value addition	2.8
8	Specification and Control of Agricultural Products	2.0
	Liker scale	2.4

Statistical analysis (2019)

As can be observed from Table (16) shows the Likert scale about the benefits of the members from the extension services in marketing production represented in the terms: Business Facilities, Provide Data & Market viability study, Marketing Information, Provide Marketing Information in time, Entering Communication, Technology, Transfer Agricultural Production& market it, value addition and Specification and Control of Agricultural Products, Average Likert scale for Agricultural extension Services in marketing production was (2.4) degrees indicated that attitude of the members with the benefits provided to them is positive at a level of more than (2) degree, that means positive attitude Agricultural Extension Services in marketing production that provided by Wad Ramli Extension agents. The researcher believes that the positive services it's the important agricultural cooperatives services, especially the Transfer Agricultural Production&

market it, value addition because it benefits the economic benefit of the members.

Table (4-17) The Likert scale for measuring the attitude respondents towards their benefits from the agricultural extension Services.

No	Items	Degree
1	High Productivity	2.8
2	Higher economic return	2.9
3	Participation of Members in the community activities &Development	2.3
4	Activities of the members in participation and empowerment	2.3
5	Increase domestic marketing	2.6
6	Increase Externally Market	1.4
	Liker scale avarge	2.4

(Statistical analysis 2019)

As can be observed from Table (17) the Likert scale about the attitude of the members towards the benefits from the agricultural extension services represented in the terms: High Productivity, Higher economic return, Participation of Members in the community activities &Development, Activities of the members in participation and empowerment, Increase domestic marketing, Increase Externally Market. The average Likert scale to each statement was above (2.4) degrees in general, this result means that members have a positive attitude towards benefits from the services in this programme expect towards crease externally market to the farms.

Table (4-18) The Liker scale for measuring the attitude respondents towards the principles of the cooperatives

No	Items	Degree
1	Identify the responsibility for each individual and for all	2.2**
2	Cooperatives controlled by their members	2.1**
3	Members' Economic Participation.	2.2**
4	Members have equal voting rights (one member, one vote).	2.1**
5	Cooperatives provide education and training for their members	1.9**
6	Cooperation among others Cooperatives.	2.0**
7	cooperatives work for the sustainable development of their communities through policies accepted by their members	2.0**
	Liker scale	2.0**

Statistical analysis (2019)

(2.5 divided point determent by researcher) more than =Satisfaction* and less than =Dissatisfaction**

From table (18) it's clear that the cooperative members were dissatisfied (2) with the Agricultural Extension activities rendered to them in building their capacity in general principles of the cooperative. This result is reflected from all items in table (18) which all less than Likert average (2.5 divided points). This indicated that insufficiency in the awareness of the cooperative members towards general principles of cooperation. This result checks the hypothesis research which indicates that there are negative attitudes of members towards the general principles of cooperatives.

this result agreed with the similar study conduct in India by henry -A ,Dakurah (2005) majority (93%) strongly disagreed when asked about cooperatives principles and if one had heard about cooperative but was not familiar with the way they work.

5. The chi-square test result:

This test used to measure the level of significance of the relationship between search variables that were included in the study hypotheses at the level of significance 0.05 as a measure of the relation.

Extension activities and members participation

Table (4-19) the chi-square test between members participated in field School activities and Increase of their income

	Services that Increased in members income	
	chi-square	Significant level
Farmers field school	14.260*	0.003
Demonstration field	0.113	0.990
Field and office visit	1.203	0.752
Training and courses	15.069*	0.002
Extension messages	14.318*	0.003

(Statistically analysis, 2020)

*significance within (0.05)

The result on table 19 showed that there's a relationship between members participated in Farmer's field school and Increased in members income, within the level of significance (0.003). No relationship between Demonstration fields and Increased in member's income within the level of significance (0.990). No relationship between Field and office visits and Increased in member's income, within the level of significance (0.752)

There's a relationship between Training & courses and Increased in members income within the level of significance (0.0020) at a level of 0.05.

It can be seen in Table (19) there's a relationship between Extension message as an extension activity and member's income increase, within the level of significance (0.003)

Chapter five

Summary of the results, conclusion & recommendation

5-1. Summary:

1. 16.5% of members within the age of 31- 40 years.
2. The educational level 8.6% of respondents had a university education and above
3. The rate of family stability in the community more than half.
4. 99.7% of members have knowledge about the agricultural extension office.
5. The activities were presented in different ways, 97.9% represented by Farmer's field schools.
6. 2.1% of respondents received training courses from others sources' .
7. Market information is one of the most important services that can be provided by the Agricultural Extension agents.
8. 50.7% of the respondents have received extension courses from the agricultural extension agents in the area.
9. 44.2% increased the member's income.
10. Most of the members have received extension courses from the agricultural extension agents in the area.
11. 67% of the Respondents ware mentioned that the extension program was presented not enough.
12. The society provided 91% of extension services to their members
13. **73.6% of members receive Agricultural Technical package.**
14. There was a positive attitude toward the Technology Transfer, and value addition.

15. Association members have a negative attitude toward the Democratic Member Control, Autonomy and Independence.

16. There's a relationship between agricultural extension activities (Farmer's field school, training & courses and Extension message) and members income increase.

5-2. Conclusions:

Based on the findings of the study, it is concluded that:

Agricultural extension activities to be revitalized and more effective in meeting the diverse needs of the farmers, the challenge in this study is how to help the members of cooperatives to identify the agricultural extension activities and approaches to be able to operate more effectively.

Years of formal education and age of the respondents are the main factors that affect access to extension information.

Farmers' attitude towards the Agricultural Extension activities provided to them was positive; that the farmers were satisfied with these services.

The farmers also considered the Agricultural Extension such as Farmer's field school; training & courses and Extension messages are effective.

Extension services in agricultural cooperatives activities must be intensified.

5-3. recommendations:

In light of the findings from the study, the following recommendations:

To the agricultural extension & technology transfer administration:

1. It is important for the extension to work closely with farmers, helping them to take the initiative and generally encouraging them to become involved in extension activities and promote knowledge-sharing, collective learning and collective working.

2. Extension has to identify innovative success cases and have to be documented. These documented cases can be used in the training and other activities as a source of inspiration for the farmers for replications.
3. Agricultural Extension activities should be planned with the full involvement of farmers to increase their level of participation.
4. Agricultural extension agents should raise awareness of the members on the general principles of cooperatives

To the government and ministries of agriculture:

- 1• Qualified Agricultural extension staff should be provided
2. Qualified Agricultural extension staff on cooperatives should be provided
- 3• Training of the Agricultural extension staff should be addressed
- 4• horizontal coordination between researchers, farmers' groups, NGOs, private- and public-sector entities, and regional and local governments in charge of strategy and policy implementation., as well as vertical coordination between public bodies, research and academic institutes, guide education, training and research in cooperatives management.

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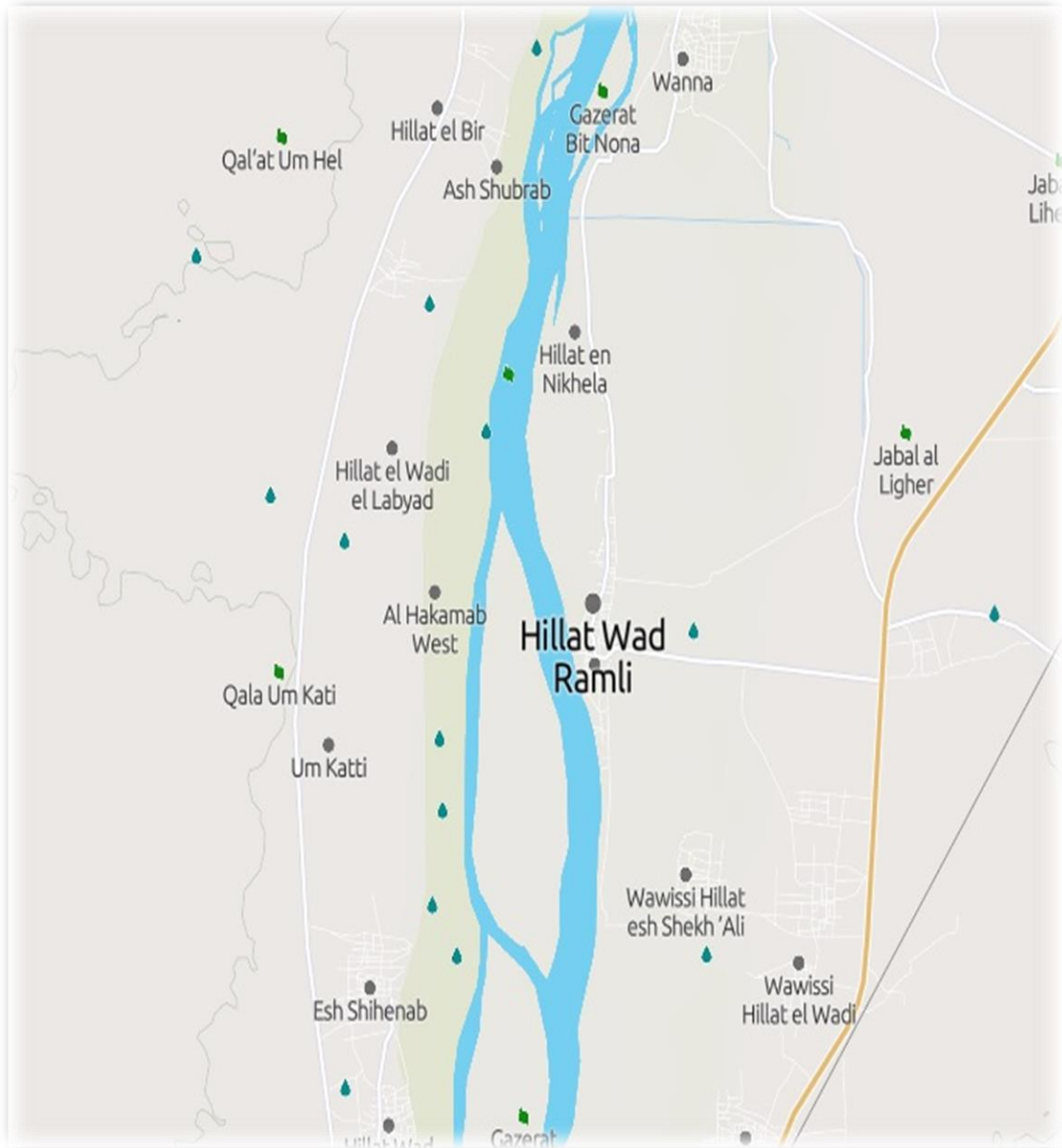
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Attachment 1 – Abbreviations

List of abbreviations

Abbreviation	Full Form of the Abbreviation
ICA	The international cooperative Alliance
USDA	United States Department of Agriculture
UNDP	United Nations Development Programme
CIS	Commonwealth of Independent States
IADA	Integrated Rural Development approach
FFS	Farmers' Field School
FAO	United Nations Food and Agriculture Organization
GCU	General Cooperation Union
3-H	Agriculture Healthy, High Quality and High Technology
ILO	International Labor Organization
IYC	United Nations International Year of Co-operatives
UN	the United Nations
IFPRI	International Food Policy Research Institute (IFPRI):
IADA	Integrated Agricultural Development Approach
CDP	Community Development Programme
GCU	General Cooperation Union

Attachment 2 – Wad Ramli map



Attachment 4 - Abu Halima society Production



Attachment 5- percentage of Likert scale

Table (14) Agricultural Extension Services that help the members of cooperative in marketing production.

No	Text	More sufficient		sufficient		Sufficient enough		insufficient	
		Fre.	%	Fre.	%	Fre	%	Fre	%
1	Farmers field school	3	1.0	16	5.5	160	54.8	113	38.7
2	Demonstration fields	3	1.0	15	45.9	144	49.3	130	44.5
3	reciprocals visits	2	.7	31	10.6	174	59.6	85	29.1
4	Lectures and seminars	2	.7	29	9.9	163	55.8	98	33.6
5	Extension message	7	2.4	34	11.6	159	54.5	92	31.5

Table (15) Agricultural extension activities that helped on member's capacity building

No	Text	help very much		help more		help		not help	
		Fre.	%	Fre.	%	Fre	%	Fre	%
1	To know how management cooperative Society	51	17.5	87	29.8	131	44.9	23	7.9
2	Book keeping and accountants of the Association	38	13.0	89	30.5	134	45.9	31	10.6
3	Supervising and monitoring the activities of the society	38	13.0	80	27.4	148	50.7	26	8.9
4	Communication between Association Members	55	18.8	81	27.7	39	13.4	39	13.4
5	How to conduct periodic meeting for dissection	22	7.5	86	29.5	136	46.6	48	16.4
6	Report writing	12	4.1	63	21.6	122	41.8	95	32.5

Table (16) Agricultural Extension Services in marketing production.

No	Text	Strongly agree		agree		Disagree		Strongly disagree	
		Fre.	%	Fre.	%	Fre	%	Fre	%
1	Business Facilities	32	11.0	81	27.7	145	49.7	34	11.6
2	Provide Data & Market viability study	26	8.9	83	28.4	139	47.6	44	15.1
3	Marketing Information	6	2.1	64	21.9	164	56.2	58	19.9
4	Provide Marketing Information in time	13	4.5	63	21.6	153	52.4	63	21.6
5	Entering Communication Technology	72	24.7	63	21.6	112	38.4	45	15.4
6	Transfer Agricultural Production& marketing	6	2.1	62	21.2	135	46.2	89	30.5
7	value addition	5	1.7	44	15.1	130	44.5	113	38.7
8	Specification and Control of Agricultural Products	18	6.2	47	16.1	133	45.5	94	32.2

Table (17) Services has to lead to.

No	Text	Strongly agree		agree		Disagree		Strongly disagree	
		Fre.	%	Fre.	%	Fre	%	Fre	%
1	High Productivity	96	32.9	78	26.7	93	31.8	25	8.6
2	Higher economic return	84	28.8	94	32.2	101	34.6	13	4.5
3	Participation of Members in the community activities &Development	18	6.2	84	28.8	168	57.5	22	7.5
4	Activities of the members in participation and empowerment	28	9.6	80	27.4	147	50.3	37	12.7
5	Increase domestic marketing	79	27.1	60	20.5	103	35.3	50	17.1
6	Increase Externally Market	9	3.1	21	7.2	35	12.0	227	77.7

Table (18) member's attitude about the principles of the cooperative

No	Text	Strongly agree		agree		Disagree		Strongly disagree	
		Fre.	%	Fre.	%	Fre	%	Fre	%
1	Full Right to select those who reprehensive you in administrative	43	14.7	101	34.6	23	7.9	125	42.8
2	Conduct Periodic election to allow a large members to participate	28	9.6	111	38.0	22	7.5	131	44.9
3	Mandate to representation in elections	17	5.8	93	31.8	51	17.5	131	44.9
4	Identify shares to participate in the membership.	40	13.7	101	34.6	26	8.9	125	42.8
5	Identify the responsibility for each individual and for all levels of leadership	40	13.7	92	31.5	29	9.9	131	44.9
6	Withdraw the trust of membership in case of a breach.	15	5.1	93	31.8	37	12.7	147	50.3
7	participate criticism and self criticism..	8	2.7	90	30.8	37	12.7	157	53.8
8	Integrating Supervision and guidance between the board of directors and leadership levels and members of the Association.	29	9.9	95	32.5	19	6.5	149	51.0
9	Ensure the approval of large members when a change occurs.	25	8.6	92	31.5	21	7.2	154	52.7

Attachment 5 Questionnaire Correction

بسم الله الرحمن الرحيم

التاريخ: يوليو 2019

السيد/ الأستاذ/ بكري آدم صالح

السلام عليكم ورحمة الله تعالى وبركاته

الموضوع/ تحكيم إستمارة جمع معلومات

إشارة إلى الموضوع اعلاه مرفق لكم الإستمارة المتعددة بغرض تحكيمها وإبداء الرأي العلمي والفني بها، هذه الإستمارة أعدت في إطار إجراءات تطوير بحث لنيل درجة الدكتوراة حسب التفاصيل أدناه:

عنوان البحث: أثر الأنشطة الإرشادية علي أداء التعاونيات

الزراعية

(جمعية ود رملي التعاونية الزراعية - ولاية الخرطوم الجامعة)

جامعة السودان للعلوم والتكنولوجيا كلية الدراسات الزراعية قسم: الإرشاد الزراعي
والتنمية الريفية

الإستاذ المشرف: بروف . الشفاء علي ميرغني

الأستاذ المساعد: د. سعاد إبراهيم العبيد

* المرفقات كأعلاه راجياً إبداء الرأي والتوجيه.

وجزاكم الله خير ،،،،،،،،

الباحث: عبد الله محمد علي الجني

بسم الله الرحمن الرحيم

التاريخ: يوليو 2019

الاخ الكريم / احمد حمدي الله جابو

السلام عليكم ورحمة الله تعالى وبركاته

الموضوع/ تحكيم إستمارة جمع معلومات

إشارة إلي الموضوع اعلاه مرفق لكم الإستمارة المتعددة بغرض تحكيمها وإبداء الرأي العلمي والفني بها، هذه الإستمارة أعدت في إطار إجراءات تطوير بحث لنيل درجة الدكتوراة حسب التفاصيل أدناه:

عنوان البحث: أثر الأنشطة الإرشادية علي أداء التعاونيات

الزراعية

(جمعية ود رملي التعاونية الزراعية - ولاية الخرطوم الجامعة)

جامعة السودان للعلوم والتكنولوجيا كلية الدراسات الزراعية قسم: الإرشاد الزراعي
والتنمية الريفية

الإستاذ المشرف: د. الشفاء علي ميرغني

الأستاذ المساعد: د. سعاد إبراهيم العبيد

* المرفقات كأعلاه راجياً إبداء الرأي والتوجيه.

وجزاكم الله خير ،،،،،،،،

الباحث: عبد الله محمد علي الجني

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التاريخ: يوليو 2019

الأستاذ/ امية قسم الله

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