

The Role of Extension in Increasing Production and Productivity of Millet Crop in El Geneina Locality West Darfur State Sudan

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ABSTRACT

This Study was conducted in the area of El Geneina, west Darfur State, in 2017 with the aim of identifying the role of extension in increasing production and productivity of millet crop in El Geneina Locality West Darfur State. In this study, the researcher used the case study method and the stratified random sample was selected of (201) farmers, the questionnaire, interviews and direct observation were also used as tools for gathering descriptive data related to the subject, The researcher used percentage and frequency tables to analyze and interpret data .

The study found that the extension role in increasing production and productivity of millet crop in the region as an increase in production compared to previous years and attributed to several reasons:

- Stability of society in the region
- Expansion of agricultural land
- Provide improved seed
- Application agricultural technologies
- Continuous agricultural extension from the competent authorities
- Farmers follow modern agricultural methods in their agriculture

This indicates the adoption of modern agricultural technologies by farmers, which was reflected in the increase productivity in the unit area with the increase in production in general, this is due to the complementary role of the organizations working in the field of agriculture, represented by FAO and the ministry of agriculture represented by the department of agricultural extension and the Geneina agricultural research station for their active role in developing and rehabilitating the capacities of producers in the agricultural sector.

KEY WORDS: West Darfur, increasing production, millet, extension, El Geneina.

❖ INTRODUCTION

Millet (bulrush millet pear millet)

Lateen Name: penniset typhoid's (burm.f.) stapf.f.ex Hubbard

Millet is one of the main grain crops in Sudan, India and some African countries, it is also important in the agricultural cycle and cropping system, it is one of the summer feed crops due to its rapid growth, drought resistance and rapid maturity . Therefore, it is sometimes grown as an emergency crop for some previous crop failures; millet is considered one of the most important crops in western Sudan because it is the only good yield crop for sandy land. The western states produce 95% of their total production in Sudan, millet is fed on millet grains and is a staple food in India and Africa where grains are cooked as rice or grinded like wheat, poultry and animals feed on cereals and vegetative plants are used as animal feed (Al-khader, 2008)

Millet is a food crop because it contains starch, protein, vitamins fatty acids, fatty acids, essential and non-essential amino acids, it also contains protein in high amounts and fiber. Millet also contains vitamins such as vitamin (B) niacet, riboflavin and thiamine, as well as carbohydrates and a number of minerals such as calcium, potassium, sodium, zinc, copper, phosphorus, boron, iron and magnesium.(Aldabi, 2008)

❖ Study area :

Geneina is located in west Darfur state between the latitudes in 45 – 13 north and longitudes 43-22 east and has an area of about 3,000 square kilometers and has a population of about 530864 people, it is bordered to the north-east krink locality, from the north sirba locality, south-west beida locality, south habila locality, west by the state of Chad .it is the capital of west Darfur state, the capital Khartoum is (1200) kilometers away and (27) kilometers from the borders of Chad. The municipality has five administrative units: El Geneina, ardamata, tandalty, aish burra, most of the local population practices 79% trades of agriculture and grazing. 21% they practice trade, free employment and the employment sector.

The most important crops produced in the state are millet, which is the main food in addition to corn, peanuts, sesame and vegetables such as okra, watermelon and horticultural crops produced by the gardener sector of mango, orange, guava and banana. The kaja valley and rata valley pass from the south, and the western asanga valley,

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average local rainfall is between (180-800) mm, the region is characterized by the poor savanna climate in the north of the rich savannah region in the south. The local area is also characterized by a livestock wealth of (1.745.066) heads; the region is famous for handicrafts such as the shoe Industry(ministry of agriculture, 2017).

❖ **Research community:**

Local farmers who were trained and qualified to increase the production and productivity of the millet, which was selected sample of the extent of the agricultural land of (950) farmers.

❖ **The study sample:**

The random sample was selected to collect the data of (201) respondents from among the respondents who were trained to increase the production and productivity of millet.

❖ **Research methodology:**

The researcher tackled the descriptive approach and the methodology of social survey where the current situation of the methods used to increase the production and productivity of the millet in the region and then studied in an analytical study.

❖ **Methods of data collection** :The researcher relied on two sources:

1. Primary sources the following tools have used
 - ✓ Questionnaire
 - ✓ Interviews
 - ✓ Note as tools for quantitative data collection
2. Secondary sources are the following :
 - ✓ Books and reports

❖ **Data analysis:**

The data was analyzed by computer used program the statistical analysis program for social sciences (SPSS)

❖ **The table shows the socio-economic characteristic of the respondents in the study area:**

Category	Repetition	Expected N	Observed N
Gender			
Men	97	100.5	-3.5-
Female	104	100.5	3.5
age			
15-25	27	50.2	-23.2-
26-35	69	50.2	18.8
36-45	73	50.2	22.8
More than 45	32	50.2	-18.2-
education level			
Uneducated	45	33.5	11.5
Religious education	47	33.5	13.5
Primary	19	33.5	-14.5-
Secondary	33	33.5	-.5-
Graduate	40	33.5	6.5
Postgraduate	17	33.5	-16.5-
Social status			
Married	133	40.2	92.8
Single	32	40.2	-8.2-
Absolute	11	40.2	-29.2-
Window	20	40.2	-20.2-
Case of abandonment	5	40.2	-35.2-
The basic profession of the head of the family			
Farmer	146	40.2	105.8
Dealer	16	40.2	-24.2-
Employee	27	40.2	-13.2-
Worker	8	40.2	-32.2-
Other	4	40.2	-36.2-
Agricultural methods used			
Modern methods	137	100.5	36.5
Traditional methods	64	100.5	-36.5-
Provide sufficient quantities of improved millet seed locally			
Available in sufficient quantities	83	67.0	16.0
Not available in sufficient quantities	111	67.0	44.0
Sometimes sufficient quantities are available	7	67.0	-60.0-
Local agricultural extension services are available			
There are local extension services	153	100.5	52.5
There are not local extension services	48	100.5	-52.5-
Technical packages for millet			
Technical packages were introduced	147	100.5	46.5
Technical packages are not provided	54	100.5	-46.5-
The role of agricultural extension in the production and productivity of millet			
Extension has a role in increasing production and productivity	152	67.0	85.0
Extension has not role in increasing production and productivity	25	67.0	-42.0-
Extension has a role in increasing production and productivity sometimes	24	67.0	-43.0-

Field study (2017)

☒ LITERATURE REVIEW

❖ **Millet crop in the world:**

Millet is a staple food in some areas of Africa and Asia. It is highly nutritious, millet is found in Sudan and Ethiopia. In India millet occupies about 22 million hectares and in Egypt there is very little.

❖ **Millet crop in the Sudan:**

Millet is the preferred food for most of the population of western Sudan, where its cultivation extends mainly in the sandy lands that occupy the northern parts of these states. Rain rates are mostly less than 400 mm in the world, making millet the main crop that cannot compete with other grain crops such as sorghum in dry environments, millet comes after sorghum directly in terms of area and production. The area cultivated annually is about 5 million feddans. 95% of this area is cultivated in the western states of Sudan, while the rest of the regions include Damazin, Qudarif, Sinar, White Nile and Toker. 97% of the area is cultivated in the traditional rain sector. In recent years, millet cultivated areas have increased in some seasons to more than 7 million feddans, but the productivity has remained at an average of more than 100 kg per feddan.

❖ **Millet crop in west Darfur state:**

Millet is one of the most important food security crops in the state of west Darfur, where more than 75% of the state's population depend on them for their staple food and sorghums. It is cultivated in sandy lands that occupy large parts of the state, with precipitation rates of less than 400 mm per year, making this land marginal, unsuitable for the production of other cereal crops other than millet. The research program of the agricultural research authority aims to raise the productivity of the millet crop and improved its quality by raising improved varieties, which are characterized by rapid ripening and carrying drought with high productivity and resistance to the diseases and diseases prevalent in the production areas and better ways to combat it. In addition to the availability of quality characteristics required and the development of improved agricultural methods of production to reduce its cost (Al-khader, 2009).

❖ **Recommended Items:**

Ashana and Ugandan variety of northern state environments because of the low rainfall rates and these varieties characterized by early maturity and high productivity, the variety was resistant to white fluffy disease, Dembi, Kano and May are planted in the south of the state where rainfall is high, the varieties are highly productive but mature.

Preparation of the land:

The most important land for the production of millet is the sand dunes. In order to preserve this land from erosion and deterioration, the following must be observed:-

- Avoid vegetation removal (trees)
- Keep large trees on the farm as windbreaks
- Do not use heavy plows and light plows can use by the animal

❖ **Dates of growing:**

The optimal date for growing millet is when the rainfall is sufficient and the presence of moisture allows the bulbs to precipitate more than 100 mm.

Also, millet is grown by remeel and is intended to grow the crop before precipitation (dry agriculture) and the probability of success of this method is about 67% and more likely to succeed if it is done in the last two weeks of June and the first week of July.

Farming method:

Agriculture is preferred to drill after plowing the soil with distance of 75 cm between the rows and 50cm between the plants on the row.

❖ **Treatment and seed rate:-**

Seeds are treated with seed probes such as Thiram, Raxil and Alqawsho at rate of 3 grams per kilogram seed and consider mixing well.

❖ **Seed rate:**

3-4 kilo per feddan and the appropriate number of grains 7-8 tablets per hole and cut seedlings in to three in one hole after 2-3 weeks of planting.

❖ **Weed Control:**

Use of herbicides such as 2,4D at a rate of 0.32 liters per feddan after 3-4 weeks of germination, or syrup peroxide with a rate of 1.2 liters per feddan before germination or other recommended pesticides and preferably manual hygiene when required.

❖ **Some pests have control:**

1. Fluffy whiteness:

In case of this disease the spike becomes completely or partially black.

❖ **Control:**

- Destruction of crop residues
- The dimensions of the pathogenesis and its delivery as soon as they appear.
- follow the agricultural cycle contains a crop immune to the disease.
- use millet sample to be resistant
- use seed sterilizers

2. Boda:

The Boda parasite is one of the greatest threats to millet yield and the incidence of landfall is very high in the state due to the lack of use of agricultural cycle.

The danger of boda lies in its complete intrusion into the plant in its diet and when the infection occurs, the entire crop is destroyed.

❖ **Control:**

Boda fights in the following ways:

- Cleaning the field of boda plant before the formation of flowers and seeds of boda plant
- Follow the appropriate agricultural cycle in which non-boda crops are grown , such as legumes .
- Use herbicides such as azazine and propazine.
- Use of municipal or industrial fertilizers.

❖ **Harvest:**

Harvesting is less expensive than manual harvesting because it takes less time and thus reduces the loss of yield.

Harvesting occurs when the crop reaches the physiological maturation stage, this stage can be defined as follows:

- The presence of a black dot on the side of the seed attached to the gall bladder (glumes).

After harvesting the crop must be left in the ground long enough to ensure dry until 10% temperature and then pool in one place to be taught automatically or manually

Take into account the absence of the crop before drying to avoid the incidence of fungal diseases such as wool, mold and spiders.

Table (1) shows the frequency and percentage of sample member by availability of local extension services

Category	Residual	Percentage %	Expected N	Observed N
Yes	153	76.1	100.5	52.5
No	48	23.9	100.5	-52.5-
Total	201	100%		0.0

A field study 2017

Table (1) shows that 76.1% of the respondents confirmed the existence of the extension services in the local area, while 23.9% of the respondents did not have the extension services. The researcher believes that the availability of agricultural extension services in the municipality is attributed to the complementary role between the organizations working in the field of agriculture and the ministry of agriculture represented in the transfer of technology and extension and the research station Geneina agricultural for their effective role in providing extension services and rehabilitation of the capacity of producers in the state to increase production and productivity.

Table (2) shows the frequency and percentage of sample member by according to the technical packages of the millet crop

Category	Observed N	Percentage %	Expected N	Residual
Technical packages were introduced	147	73.1	100.5	46.5
Technical packages are not provided	54	26.9	100.5	-46.5-
Total	201	100%		0.0

A field study 2017

It is noted from table (2) that 73.1 % of the respondents were provided with technical packages for the millet crop in the local through the extension department and the state agricultural researcher station. While 26.9% of the respondents did not provide technical packages for millet, which requires the extension department to provide more services.

Table (3) shows the frequency and percentage of sample member by the role of agricultural extension in increasing production and productivity of millet

Category	Observed N	Percentage %	Expected N	Residual
Extension has a role in increasing production and productivity	152	75.6	67.0	85.0
Extension is not a role in increasing production and productivity	25	12.4	67.0	-42.0-
Extension sometimes has a role in increasing production and productivity	24	11.9	67.0	-43.0-
Total	201	100%		0.0

A field study 2017

From table (3) it is clear that 75.6 % of the respondents confirmed that extension has a significant role in increasing the production and productivity of millet, while 12.4% of respondents said that extension dose not play a role in increasing production and productivity. The researcher believes that extension has a role in increasing the production and productivity of millet in the local area relative to the volume of production during the last years compared to production in previous years. This is attributed to the stability of communities and the expansion of the agricultural area with the availability of improved seeds and the application of modern technologies extension from the competent authorities, according to reports of the Ministry of Agriculture West Darfur 2017

❖ Results:-

The results of the study showed the following:

1. 51.7 % of the respondents are women, indicating that women play an important role in agricultural work in Darfur
2. 70.6% of respondents are between the ages (26 -45) years.
3. 66.2% of respondents are married and this indicates family and social stability.
4. 72.6% of respondents consider agriculture the basic profession.
5. 68.2% of respondents follow the modern agricultural methods and this indicates the adoption of modern agricultural technologies by farmers.
6. 55.2% of the respondents did not have sufficient quantities of improved seeds in the local area.
7. 76.1 of respondents confirmed the existence of agricultural extension services in the local.
8. 73.1 of the respondents provided them with technical packages for millet in the local area.
9. 75.6 of the respondents confirmed that the guidance plays a role in increasing the production and productivity of millet in the local area.
10. 51.7% of the respondents indicated that there was a significant increase in the volume of millet production compared to previous years; this is attributed to the respondent's assessment of the stability of the communities and the expansion of the agricultural area with the use of improved seeds and the application of modern technologies.

❖ Recommendations:

Through the results, the study reached several recommendations, the most important:

1. Produce and distribute sufficient quantities of improved millet seeds of good quality from high – yielding and resistant varieties that adopt to the state climate,
2. Provide extension services to all farmers from training and rehabilitation on the use of modern agricultural techniques and convince them to use municipal fertilizers to reduce the cost of production.
3. Transfer of problems faced by farmers to the competent authorities
4. Raising awareness for farmers on how to deal with and benefit from existing local banking institution to provide financing with the facilitation of procedures and guarantees required in proportion to their abilities and their cognitive and physical capacities.
5. Fogging the seeds before carrying out multiplication in order to avoid the infection of pests and diseases that affect the seed before germination.
6. The need for coordination between the extension system and agricultural extension agents to increase production and productivity of millet because it represents a major crop in the region.

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