

THE ROLE OF MICROFINANCE TO IMPROVE AGRICULTURAL PRODUCTION IN THE TRADITIONAL RAIN SECTOR, SUDAN

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ABSTRACT

This study was carried out to investigate the role of microfinance in improving agricultural production in Wad Elhillew locality, Kassala state, Sudan. The simple random sample was adopted to select 105 farmers in the study area. A structured questionnaire was used for primary data collection. Descriptive analysis used to display the socio-economic characteristics of respondents, multiple regression and T-test were also used to test the relationships between some variables. The findings of multiple regression analysis revealed that education level, farm ownership, affiliation to agricultural associations and unions had significant positive regression weights, while the agricultural experience and period of residency scales had positive regression weights, and the age scale had a significant negative regression weight. The results of the T-test analysis reflected that there was a significant difference between adopters and non- adopters in term of the total production of two crops (Sorghum, and Sesame). The study recommended some interventions to improve and develop the microfinance program.

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INTRODUCTION

Small-scale agriculture and the harvesting of natural resources provide livelihoods for over 70% of the African population, between 70-80% of this population lives in the rural areas and farmers are predominantly women. Small-scale farmers have certain defining characteristics: they derive their livelihood from holdings of less than 2-5 hectares (usually less than 2 hectares), in normal circumstances they own between 10 to 20 heads of livestock, although often, they have less than 2 or none at all. Small-scale farmers also tend to practice a mix of commercial and subsistence production (in crops and / or livestock), the family provides the majority of labour, while the farm provides the principle source of income, this situation requires optimal exploitation of natural resources to increase agricultural production and achieve food security (Munyua *et al.*, 2008). According to Yahia (2014) the development of agriculture means increase production by one of two main methods, by developing the means of production, for example, using tractor rather than using the traditional plow, so that the

individual can grow 1,000 faddans instead of growing one faddan, or by more effective use of agricultural resources to increase agricultural production. Agricultural development and sustainable growth depend on a number of following important factors (Figure 1); they are: finance, agricultural policy, agricultural inputs, search, extension, marketing, transport, and education, these factors represent a continuum of episodes affecting the family farm, breaking any of these factors lead to break of this cycle and the reduction effectiveness of other factors. The higher council for agricultural renaissance (HCAR, 2008) reported that, the agricultural needs may be grouped into five headings: agricultural inputs; extension education; agricultural technology; agricultural credit; and marketing, modern farm inputs are needed to raise small farm productivity, these inputs may include fertilizers, improved variety of seeds and seedlings, feeds, plant protection chemicals, agricultural machinery, and equipment and water. According to Hamad (2013) agricultural development is a complex process that is affected by the interaction and inter-relation of many factors, these factors range from natural resource development in respective area, socio-economic, cultural, and political factors, as a part of agricultural development in certain agro-ecosystem, the agribusiness involves the use of appropriate

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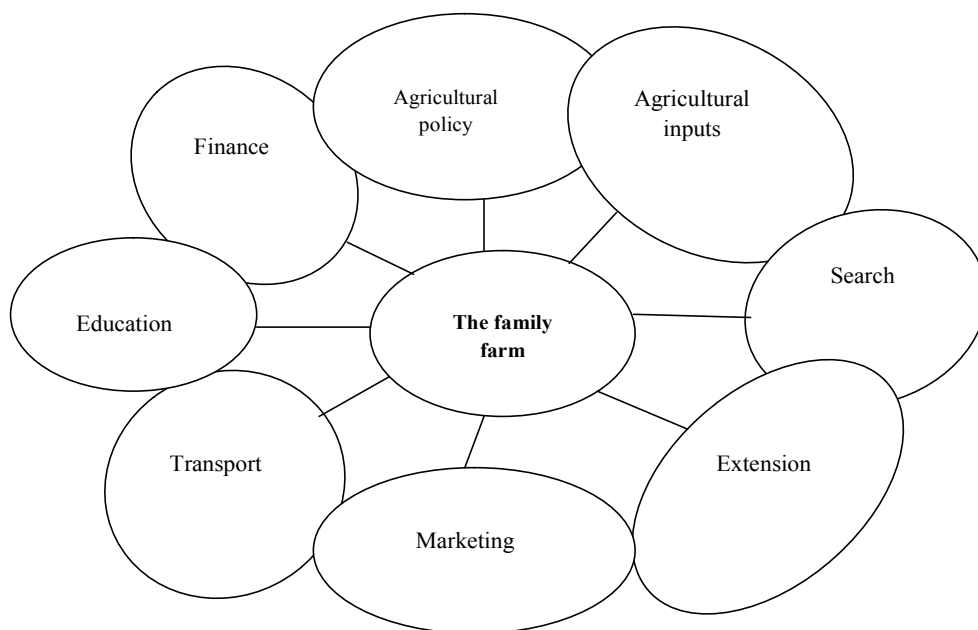


Figure 1. Overlapping factors affecting agricultural development, Source: (Yahia, 2014)

technology packages, the provision of farm inputs, and the existence of infrastructures and supporting institution such as financial and extension institutions, postharvest and marketing services of agricultural products. Many factors contribute towards the development of agriculture, including extension as an institutional input, Agricultural technologies and techniques are constantly changing and farmers need to be made aware of and know how to use agricultural innovations for the exploitation of inherent yield potentials (Sharafat *et al.*, 2012). In Sudan ministry of council of ministers (MCM) (2010), reported that the natural resources, climatic conditions, social environment, technology used in agricultural production and investment procedures and development strategies pursued by successive governments, led to different five farming systems, they are: a system of irrigated agriculture, system of rain-fed mechanized agriculture, the traditional system of rain-fed agriculture, in addition to livestock systems. Traditional agriculture is a system practiced by small farmers in Western, Southern, Central and Eastern Sudan in the clay soil and sand for the production of food crops such as sorghum and millet and limited amount of cash crops, such as sesame, peanuts in small scattered holdings vary in size from 15 - 30 faddan of the family, farms this system also includes livestock and production of gum. The population in some cases additional work to earn more, a traditional household farming depends entirely on rainfall distribution in the autumn and prevails in the geographical areas in excess of 350 mm rainfall. Family member and social groups (Nafir) represent the major source of manual labor in addition to the limited amount of hired labor and use of draught animal in some pilot projects, There is rare use of agricultural inputs or any use of modern technology which is already rare and difficult for small farmers to access because finance and are forced to seek in the process of traditional credit "shell" system form the village (Amir, 2018). So the main problem which facing the agricultural development in the different farming system in Sudan is economic constraints and lack of financial resources, because the agricultural sector depends almost entirely on tools, machinery, different agricultural inputs and different spare parts with the lack of agricultural exports and declining exchange rate in recent years, all this affects the agricultural sector negatively and reduces the level of farmers' income (Eltaib, 2010).

Many local and regional experiences have confirmed that microfinance services have contributed to the economic, particularly rural poor, access to technical and financial support to start economic activities that provide employment opportunities, increase their incomes and raise their living standards. Microfinance also contributes to local development and increases national output (bank of Sudan, 2011). Mohammed (2017) reported that financing is the provision of funds and cash to spend on investments and the formation of fixed capital in order to increase production, finance plays a key role in the process of economic and social development without funding cannot establish enterprises and production projects and others service. With the increasing trend in many developing countries towards small and micro enterprises as an important sector for economic and social development, microfinance has become one of the most important innovative mechanisms for achieving the objectives of rural development and alleviating poverty and its effects, and the UN's 2005 International Microfinance Declaration is an international recognition of the role that microfinance programs can play in providing job opportunities and raising living standards within an integrated sustainable development framework (Siddiq, 2009).

Microfinance is defined as the provision of financial services to the economically active and low-income people. The services include not only credit but also a number of other services such as savings, insurance, training and capacity building, which means a variety of financial and non-financial services (Abdel Wahab, 2009). The Bangladesh Grameen Bank is the first and most famous local microfinance institution and has become a model for most countries in the world. In December 2004, I had two out of five million poor people who did not own land, 94% of whom were women, and then various MFIs appeared in several developing countries in Latin America, Asia and Africa (Omar, 2012). Funding began in the Sudan during the 1980s. There are many traditional financing experiences such as Shill, Khitta, Nafir, charitable funds and social cooperatives. During the 1990s, the monetary and financing policy was concerned with the financing of productive families, craftsmen and professionals, and considered them to be priority sectors in bank financing, allocating 10% of the bank financing portfolio to

microfinance, and then raising to 12% in 2007, As part of the state plan aimed at alleviating poverty among the sectors of society and raising the standard of living and pushing productive activity to achieve balanced economic development throughout the country, in addition to the attention of civil society institutions and social funds (Majzoub, 2014). To contribute to this, 2007, an integrated unit for supervision, enactment of legislation, policy formulation and development of social and developmental conditions in the field of microfinance. As part of the Central Bank's policy to encourage microfinance by providing financing to vulnerable groups and all sectors, the Agricultural Bank of Sudan since 2011 started to distribute microfinance services to small rural farmers, rather than to large farmers, the economic pyramid through microfinance loans through branches of the Agricultural Bank in the various states of Sudan. Perhaps the microfinance program, which care of government of the Sudan in the last period, expected to contribute in advancement of agricultural development, but this program did not undergo adequate assessment studies. Therefore, this study was conducted in Wad Elhillew Locality, Kassala State, for the purpose of evaluation and exit recommendations that assist in the development of this program.

Objectives of the Study

This research was conducted to assess the role of microfinance to improve agricultural production in the traditional rain fed sector in Wad Elhillew Locality, Kassala State, Sudan. The specific objectives of the study were to:

1. Identify the socio-economic characteristics of the respondents.
2. Investigate the factors affecting the respondents' decision to adopt microfinance program.
3. Assess the impact of microfinance to improve agricultural production.

MATERIALS AND METHODS

Area of the Study: Kassala State is located in the North-Eastern part of Sudan. The total population of the State 1,527,214 inhabitants. Administratively the State is divided into 13 localities; namely Kassala, Atbara River, Talkuk, Rural Aruma, Hameshkoreb, Rural Khashm Al Gerba, Rural Kassala, Halfa Al Jadida, Rural West Kassala, Wad Elhillew, and North Delta (GAI, 2014). Kassala State is characterized by diverse agricultural systems, resulting in a multiplicity and diversity of crop production. The temperature average is between 32-47°. Average rainfall range between 100-150mm. Crops production include rainfed: Sorghum, sesame, groundnut and sun flower, irrigated sorghum, watermelons, fruits, vegetables, cotton, wheat, and groundnut, (Agricultural Planning and Training Administration, 2017).

Data collection and Analysis: The study was conducted in Wad Elhillew locality of Kassala State. The Simple random sample was adopted to select 105 farmers from five villages (Umali, Ummakharif, Zahana, Hamdiet, and Algargaf), purposively selected (21 respondents from each). The Statistical Package for the Social Sciences (SPSS) was used to analyze the obtained data by for descriptive analysis was carried out to display frequencies and percentages of data with one variable. Multiple regression and T-test were used to test the strength of relationships between some variables.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents: Table1 shows that 94.3% of the respondents are economically active in an age group 20-60 years old. The finding reveals that they have accumulated experience in agriculture due to having worked on farm fields for a long time. More experience which may encourage them to learn more about new developments in agriculture, because the human is able to learn until he is 75 years old (Amir, 2018). Data in table1, also illustrates that 80.6% of the respondents are educated at different levels of as 48.4%, 29.6% and 4.1% as primary, secondary education and university level respectively. High percentage of education among the respondents is a positive indicator, because educated farmers will have the ability to obtain agricultural information from different written sources, such as pamphlets, books, and agricultural newspapers and journals. However, good education level is very useful to facilitate the duties of agricultural extension agencies and personnel, because the more educated farmers expected to be more accepting and fast to implement new agricultural technologies. However, they have the ability to transfer the new knowledge and skills to other farmers, which serve to facilitate diffusion and adoption of new agricultural innovations among farmers. In this regards Yahia, (2014) commented that education increases the awareness of individuals and helps to adopt the new ideas. Regarding farms ownership, results in the table also show 79.1%, 12.3% and 8.6% of respondents farms owners, land rental, and sharecroppers respectively. The high percentage of farm private ownership indicates a greater possibility of technology adoption among the study area.

Table 1. Respondents' socio-economic characteristics

Variables	F	%	Variables	F	%
Age			Education		
20- 29	29	27.7	Illiterate	19	17.9
30-50	50	47.6	Primary	51	48.4
51-60	20	19	Secondary	31	29.6
60+	6	5.7	University	4	4.1
Total	105		Total	105	100
			Farm Ownership		
			Own	83	79.1
			Rental	13	12.3
			Shared	9	8.6
			Total	105	100

Obtaining of microfinance: As can be seen in Table2, 97.1% of interviewed farmers said they needed microfinance, this finding indicates that there is a great need for funding among farmers to manage agricultural work, while only 2.1% of them said they did not. 65.7% of respondents, who needed for microfinance, had obtained microfinance on three different frequency levels as 23.2% 60.9% and 15.9% one time, 2-3 times and more than 3 times respectively. Those who obtained microfinance in the level of 2-3 times and more than 3 times they have succeeded in managing the microfinance in agricultural work, so they continued to receive funding. While 34.3% of respondents did not obtain microfinance, due to four reasons according to their comment, they are: do not know the program (25%), difficulty of procedures (29.7%), fear of risk (38.9%), and no desire (8.3%), this reflect the absence of awareness, and therefore the need of make efforts to provide extension programs to introduce microfinance, facilitate the procedures and remove the fears among farmers to further adopt the idea of microfinance.

Table 2. Frequency distribution of respondents by obtaining microfinance

Issue	Frequency	Percentage (%)
The need for microfinance		
Yes	102	97.1
No	3	2.9
Total		
Obtained microfinance		
Yes	69	65.7
No	36	34.3
Total	105	100
Number of time funding is obtained		
One time	16	23.2
2-3 times	42	60.9
More than 3 times	11	15.9
Total	69	100
Reasons of not obtained microfinance		
Do not know the program	9	25
Difficulty of procedures	10	29.7
Fear of risk	14	38.9
No desire	3	8.3
Total	36	100

Table 3. Frequency Distribution of respondents by problems facing microfinance management

Problem	Frequency	Percentage (%)
Small size of funding	49	71
Funding delay	4	6
Agric. Season fluctuate	7	10
High production costs	9	13
Total	69	100

Table 4. Multiple Regression analysis of Adoption the microfinance program

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	8,110	4,287		2,327	,019
Respondents' age	-,183	,083	-,164	-2,113	,016
Education level	1,321	,517	,181	2,572	,005
Farm ownership	,043	,019	,141	2,251	,003
Agric. experience	,022	,001	,016	2,731	,019
Period of residenc	,126	,074	,117	2,110	,014
Affiliation to agric. associations and unions	,003	,021	,038	2,130	,002

Table 5. Results of T-test for adopters and non- adopters toward their productivity

Variable	Group	Mean Score	Std. dev	Mean dif	Std error dif	t	Sig.
Total production of Sorghum	1	58.63	61.597	37.493	8.811	3.211	0.004
	0	13.39	7.398	37.493	1.601	3.211	
Total production of Sesame	1	139.11	183.291	112.488	29.265	4.512	0.001
	0	43.33	49.799	112.488	4.475	4.512	

Problems facing microfinance management: According to table3, 71% of respondents who obtained microfinance mentioned that size of funding is small and did not cover their agricultural costs, because the maximum size of microfinance which is provided by the agricultural bank is 20000 SDG for each farmer for all agricultural operations from sowing till harvesting. The rest of respondents who had obtained microfinance commented that there are others three problems in managing the microfinance. These problem are: funding delay (6%), agricultural season fluctuate (10%) and high production costs (13%). According to Iheke (2010), education increases the ability of the farmers to adopt agricultural innovation and hence improve their productivity and efficiency. Furthermore, farmers who own the farms are more likely to look for agricultural information to improve their farm practices and achieve higher production levels. The result is entirely consistent with Yahia (2014) the adoption of mitigation measures increases if the farmer is the owner of the farm land rather than a tenant farmer, land tenure and property

rights affect the application of technologies for agricultural and natural resource management. Iheke and Agodile (2016) reported that coefficient of membership of farmers' association was positively signed and significant at 1% level. This implies increase rate of adoption of mitigation measures with cooperative membership, membership of farmers' association/cooperative serve as sources of good quality inputs, labour, credit, information and organized marketing of products. While the agricultural experience and period of residency scales had positive regression weights, indicating that interviewed farmers with higher scores on these two variables expected to adopt the microfinance program at medium level. The result has some positive implications for increased agricultural productivity because according to (Rogers, 2003), as the number of years a farmer has spent in the farming business may give an indication of the practical knowledge he has acquired on how he can overcome certain inherent farm production problems, which include the vagaries of climate change effect.

The age scale had a significant negative regression weight, indicating interviewed farmers with higher age scores are expected to adopt the microfinance program at less level to, this mean that young farmers are more willing to adopt the microfinance program than older farmers, because the young farmers are expected to be more looking for agricultural finance to develop their agricultural production, this result is consistent with Bello and Yahia (2017) who reported that results of the regression analysis show negative coefficients and t-ratios on the relationship between age of the farmers and their adoption behaviors. The implication is that the farmers' ability to adopt new farm innovations decrease with age. This result is consistent also with (Iheke and Agodike, 2016) and (Iheke and Nwaru, 2014), The coefficient of age was significant at 1% level of probability and negatively related to adoption of climate change mitigation measures. This implies that the adoption of climate change mitigation measures strategies declines as the farmer gets older. It has been noted that the older one becomes the more risk averse he/she is. This explains the negative relationship between adoption of new innovations and age.

Examine the Difference between the Productivity of two Crops (Sorghum, and Sesame) for Farmers who adopted the Microfinance Program and those who did not adopt:

Table 5 shows a significant difference between the adopters and non-adopters in term of total production of two crops (Sorghum, and Sesame). Data in the table indicate that the total production of sorghum, the mean score for adopters 58.63 and 13.39 for non-adopters with t-value 3.211, significant of 0.004. However, the total production of sesame, the mean score for adopted 139.11 and 43.33 for non-adopted with t-value 4.512 and significant of 0.001. These results indicated that farmers who adopted the microfinance program, their productivity is better than those did not adopt, this finding indicates that the fund enables the farmers to obtain all inputs of agricultural production and applied the technical packages, so thus increase the production. These results are consistent with Yahia (2017) who revealed that FFSs participants secured better agricultural productivity than the non- participants farmers, and agreed with Elhassan *et al.* (2011) who stated that to cope with these challenges of low agricultural productivity, many extension approaches have so far been used to increase productivity in general and profitability in particular.

Conclusion and Recommendations

The lack of finance represents the main challenge facing agricultural development in the rain fed sector of Sudan. Recently a microfinance program has been implemented intensively in different states of the country as an attempt to solve this problem and to enhance and improve agricultural production. The study findings of multiple regressions revealed that the level of participation in the microfinance program is associated significantly with the education level, farm ownership, affiliation with agricultural associations and union. The t-test indicated a significant difference between the adopters and non- adopters of the microfinance program in terms of the total production of two crops (sorghum, and sesame). The study recommended that development institutions assess the farmers' needs and to introduce microfinance activities accordingly. However, the Agricultural Bank of Sudan and all other funding authorities need to provide the necessary funds at the right time and facilitate funding procedures an measures relevant to farmers situations.

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