

Factors Affecting Respondents' Participation in Farmers Field Schools in Khartoum State, Sudan

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ABSTRACT

This study was conducted to determine the socioeconomic factors influencing farmer participation in the Farmer Field Schools (FFS) program in Bahari Locality of Kharoum State, Sudan. Eighty farmers were selected randomly and interviewed for this study where Frequency distribution and multiple regressions were used to analyze the data. The study findings indicate that more than 95.0% of respondents were economically active, 88.7% had formal education, 83.0% managed their own farm and 86.3% were currently married. Multiple regressions revealed that the level of participation in FFS was significantly associated with education, farm ownership, farm size, and the period of residency. In addition, the data showed that the level of application of received agricultural innovations was significantly associated with education level, farm ownership, farm size, and total income. The study recommended some interventions to improve and develop the practices and approach of the FFS approach.

Keywords: Farmers Field Schools; socioeconomic factors; participation; Khartoum Stat Sudan

INTRODUCTION

Agricultural extension has long been seen as a key element in improving agricultural development. The effectiveness of two dominant approaches to agricultural extension services—training and visit (T&V) and Farmer Field Schools (FFS)—has been widely debated (Larsen and Lilleor 2014). Agricultural extension approaches are the quick systems and methods which are used in agricultural extension work to increase agricultural productivity. There are many agricultural extension approaches commonly used in Sudan: traditional approach, training and visit system, integrated rural development approach, commodity approach, agricultural extension through universities, and the farmers' field schools (El-Hassan, 2011). The farmers' field schools approach is another, more recent tool developed to improve farmers' livelihoods. It involves season-long, field-based groups of 25 to 30 farmers who meet regularly to learn through innovation and experience. Farmer Field School is often described as a school without walls to improve farmers' decision-making capacity and stimulate local innovations for sustainable agriculture or forestry. Its participatory approach gives farmers an opportunity to make choices in methods of production through discovery-based learning tools (Alsadding, 2010). The approach is a classic example of the use of groups to promote Integrated Pest Management (IPM) (Danielsen, 2011). FFSs were intended to reach out to marginalized groups who might not have access to training, knowledge

and inputs (Erbaugh et al. 2010). Central in these group processes is the participation of members. Participation may be defined as an act of taking part in an activity, usually with others (Farid et al. 2009). Plates 1 and 2 show some examples of FFS Worldwide.

Plate 1. Some examples of FFS in East Asia.



Source:<https://www.google.com.sa/search?q=articles+on+farmers+field+schools&sa=N&tbm=isch&tbm=isch&source=univ&ved=0ahUKEwj7wo3LnuvXAhVoCcAKHSygDxQ4FBCwBAh6&biw=1920&bih=964#imgsrc=wwGtro2oT5OsZM>.

Plate 2. Some examples of Farmers FFS in Africa.



Source:https://www.google.com.sa/search?tbm=isch&q=images+of+farmer+field+school+in+africa&spell=1&sa=X&ved=0ahUKEwigxuWQkf_ZAhUF7BQKHYYdiAtwQBQg4KAA&biw=1920&bih=963&dpr=1#imgrc=IxVUvOYKxt9WfM.

Farmer Field Schools is a group contact method, and the term “Farmer’s Field School” refers to the Indonesian expression “SekolahLapangane” meaning field school. The first farmers’ field school was established in 1989 in the center of Java Island, Indonesia, during a pilot season by 50 plant protection workers to test and develop new field training methods as part of their IPM training course (Elfadual, 2012). According to the International Initiative for Impact Evaluation IIIE (2014), Farmer Field Schools is participatory method of education and enable small-scale farmers to explore and learn the skills by themselves and determine the benefits of the adoption of practices in their fields. This approach was implemented by a United Nations Food and Agriculture Organization of the United Nations (FAO) project in Southeast Asia in 1998 in the adoption of Integrated Pest Management (IPM) practices, and then applied for other agricultural purposes. The application was soon extended to many countries in Africa and Latin America (IIIE, 2014).

Moreover, as commented by IIIE (2014), FFS team building and composition of an effective group requires that training involves communication skills, problem solving and discussion management techniques to create an educational environment for the farmer to learn effective leadership skills,

implement decisions in the field, and be able to communicate information to others. El-Hassan (2011) revealed that the characteristics of the farmers' field schools approach are as follows: 1- Farmers are experts and they learn through practice and activities; 2-The field is the primary education setting, where farmers work in groups to collect and analyze data, and then present and discuss the results to reach decisions; 3-The workers in the agricultural extension are facilitators, assistants/coordinators and they participate in the discussion session; 4-The experts and the extensionists work with farmers rather than lecturing (as consultants rather than lecturers).

In Sudan, the approach was developed and introduced in its initial form by the Directorate of Agricultural Extension of the Gezira scheme in 1997 to cover all aspects of production and protection of different crops. Later, the approach became widespread in many states of Sudan, including Khartoum State (Yahiya 2017). Recently, the FFS approach has been implemented intensively in Khartoum state as a result of establishing Farmer's Field Schools Center as a partnership between the Faculty of Agriculture, University of Khartoum, and The Ministry of Agriculture, Animal Wealth and Irrigation of the Khartoum State in 2007, in collaboration with the Arab Organization for Agriculture and Development. In 2009, the Centre received financial support from different sources to extend FFS activities to cover all localities of the State (Ministry of Agriculture, Animal Wealth and Irrigation, Khartoum state, 2015). Plate 3 shows some FFS examples from Sudan.

Plate 3. Examples of FFS in Sudan.



Source: www.worldwide-extension.org/africa/republic-of-sudan (2011). Source: Technology Transfer and Extension Administration, (2011).www.ttea.gov.sd

OBJECTIVES OF THE STUDY

The main objective of this study was to investigate the socioeconomic factors affecting farmers' participation in FFSs. The specific objectives were as follows:

1. Identify the socioeconomic characteristics of the respondents.
2. Determine farmers' level of participation in activities and programs provided by FFS.
3. Examine the relationship between some socioeconomic factors (age, education, and income and farm size), affecting participation in activities and programs provided by FFS in the study area.

METHODOLOGY

This study was conducted to assess the socioeconomic factors that determined farmers participation in FFSs in East Bahari locality, Khartoum state. Eighty participants were randomly selected from 5 villages, where tables of random numbers were used to select 16 respondents from each village. Both primary and secondary data were collected and used in this study. Primary data were obtained through a direct interview schedule and observation, while secondary data were obtained from relevant sources. Descriptive statistics such as frequency distribution and percentages as well as multiple regressions were adopted for data management, analysis, and discussion, using the Statistical Package for the Social Sciences (SPSS).

RESULTS AND DISCUSSION

Respondents' Socioeconomic characteristics

Table 1 indicates that more than 95% of respondents were economically active; they were between 20 and 49 years of age; 88.7% were educated at different levels, while only 11.3% had no formal education. Data in the table also shows that 83% of respondents owned their farm, and 60% had a farm of more than 10 feddans in size. Generally speaking, these are promoting factors for the farmers to participate in FFS. In Uganda, Davis et al. (2010) found that land size was positively related to participation in FFSs. About 86.3% of the respondents were currently married, and were residents in the same area for 10 years or more, and 65% had an annual income exceeding \$3000. According to Ochago et al. (2017), findings from various countries are mixed; ownership of assets such as arable land, labor, equipment, and wealth status have been found to influence farmers' participation in groups. The results in Table 1 also revealed that 97.5% of respondents had more than 10 years of experience in agriculture.

Table 1. Socioeconomic Characteristics of Respondents.

Variable	F	%	Variable	F	%
Age			Education		
20–29	8	10	Illiterate	9	11.3
30–39	40	50	Primary	56	70.0
40–49	28	35	Secondary	14	17.5
50+	4	5	University	1	1.2
Total	80	100	Total	80	100
Farm Size (feddans)			Farm Ownership		
5–9	32	40	Own	67	83.8
10–14	39	48.8	Rent	13	16.2
15–19	7	8.7	Total	80	100
20+	2	2.5	Marital Status		
Total	80	100	Never married	3	3.7
Period of Residency			Married	69	86.3
10–19 years	76	95.0	Divorce/widow	7	8.7
20 years and more	4	5.0	No stated	1	1.3
Total	80	100.0	Total	80	100
Annual Income/year			Agricultural Experience		
Less than \$3000	28	35.0	Less than 10 years	2	2.5
3000–5000	24	30.0	10–19 years	17	21.2
More than 5000	28	35.0	20 years and more	61	76.3

Farmers' Level of Participation in FFSs

Data in Table 2 indicates that 67.5% of the group members participated in FFSs at different levels: 53.7%, 33.3% and 13% for continuous, sometimes and rarely, respectively. The Table also shows that 88.5% of non-participating respondents did not participate in FFS activities due to being busy or not interested in the program activities. Therefore, concerned authorities should develop and introduce relevant measures to attract this group to the FFS of the area.

Table 2. Respondents' Participation in FFS

Variable	F	%
Extent of participation		
Yes	54	67.5
No	26	32.5
Total	80	
Level of participation		
Rarely	7	13
Sometimes	18	33.3
Continuously	29	53.7
Total	54	100
Reasons of not participating		
Busy	19	73.1
Lack of interest	4	15.4
Do not know about the program	3	11.5
Total	26	100

Farmers' Level of Application of Received Agricultural Innovations in FFSs

Table 3 shows that 87% of the participants in the FFSs received an agricultural package containing 10 agricultural innovations (land preparation, seed varieties, sowing method, irrigation methods, fertilizer use, weeding, pests and diseases control, harvest, post-harvest, and marketing), and they applied these innovations at different levels: high 40.4%, medium, 48.9%, and low level 10.6%.

Table 3. Summary of Frequency Distribution of Respondents According to their application of Agricultural Innovations received in FFSs.

Classification	F	%
Applying the Agricultural Innovations package		
Yes	47	87
No	7	13
Total	54	100
Application level		
High	19	40.4
Medium	23	48.9
Low	5	10.6
Total	47	100

Determinants of Participation in FFSs

The results of the multiple regression analysis in Table 4 indicated that the length of residency, farm size, agricultural experience, and annual income variables had significant positive regression weights (0.044, 0.059, 0.009 and 0.001 respectively). This indicates that higher participation levels in FFSs are expected among interviewed farmers with higher scores on these scales, after controlling for the other variables in the model. It is also revealed that education level, marital status, and farm ownership had positive regression weights (0.435, 0.609 and 0.59, respectively), which indicates that the respondents who are more educated, married and with large size farms are expected to have more desire to participate in FFSs.

This result is in line with Davis et al. (2010) who showed that household heads with primary and secondary education were more likely to participate in FFSs than those with no education. The Table also shows that respondents' age and agricultural experience had a significant negative regression weight, indicating that the older participants and those with more agricultural experience are expected to participate less frequently in FFSs. In other words, young farmers are more willing to participate in FFSs than older farmers because young farmers are expected to look for agricultural information and new innovations. This finding is in line with Davis et al. (2010) who found that younger farmers in Uganda, Tanzania, and Kenya were more likely to participate in farmers' field school groups compared to older farmers.

Table 4. Multiple Regression Analysis of FFS participation.

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.086	0.669		1.623	0.109
Age	-0.020	0.082	-0.028	-0.250	0.003
Education level	0.089	0.113	0.090	0.786	0.435
Marital status	0.038	0.074	0.062	0.514	0.609
Period of residency	0.439	0.214	0.204	2.052	0.044
Farm size	0.276	0.194	0.186	1.424	0.059
Farm ownership	0.083	0.155	0.065	0.535	0.594
Agric. experience	0.295	0.110	0.311	2.673	0.009
Annual income	0.395	0.113	0.438	-3.497	0.001

Determinants of Application of Agricultural Innovations Received in FFSs

As indicated in Table, 5 the education level, agricultural experience, and annual income scales had significant positive regression weights (0.013, 0.031, and 0.050, respectively). The scales of marital status, the period of residency, farm size, and farm ownership mean that farmers with high levels of scale and participation in FFSs are expected to have more desire to apply the agricultural innovations received in FFSs to develop their agricultural work and increase their productivity.

The age scale had a negative regression weight (0.177), indicating that interviewed older farmers are expected not to apply the agricultural innovations received in FFSs, which means that younger farmers are more willing to apply the agricultural innovations received in FFSs than older farmers.

Table 5. Multiple Regression Analysis of Determinants of application of Agricultural Innovations Received in FFSs.

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.547	0.889		0.616	0.540
Age	-0.048	0.108	-0.161	-1.363	0.177
Education level	0.349	0.137	0.311	2.536	0.013
Marital status	0.095	0.102	0.125	0.932	0.355
Period of residency	0.485	0.287	0.180	1.689	0.096
Farm size	0.172	0.268	0.093	0.643	0.522
Farm ownership	0.162	0.207	0.102	0.782	0.437
Agric. experience	0.326	0.148	0.274	2.203	0.031
Annual income	0.291	0.152	0.258	1.911	0.050

CONCLUSIONS AND RECOMMENDATIONS

This study was carried out to determine the socioeconomic factors affecting the level of farmer participation in FFSs. The results revealed that the level of participation in FFSs was significantly associated with the education, farm ownership, farm size, and the period of residency. It is also indicated that the level of application of received agricultural innovations was significantly associated with education level, farm ownership, farm size, and total income. In addition, the study recommended that the approaches should develop and introduce methods suitable to the older, small-scale, and landless farmers. However, there is a need for concerted efforts by institutions supporting FFS to improve access to agricultural technologies in a sustainable manner and to achieve noticeable outcomes so as to attract more farmers.

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