



Research paper

Relationship Between Personal Characteristics of Farmers and Adoption of the Recommended Cultural Practices of Faba bean in Siliam, Northern State of the Sudan

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ABSTRACT

The objective of this study is to determine the relationship between some personal characteristics of farmers of two blocks in Siliam Scheme in Northern state and adoption of some recommended Faba bean cultural practices. A closed ended questionnaire was developed to collect the required data from 60 farmers to establish association between variables. The collected data were statistically analyzed by using (SPSS) program. Frequencies distribution, percentage and chi-square test were used as analyzing tools. The personal characteristics studied were the sex, age, education level, annual income, family size, kind of holding, the size of holding and the availability of the extension services. The recommended cultural practices were land preparation methods, sowing date, sowing methods, seed rate, number of irrigation, watering interval and period of harvest. Results showed that all the farmers were male the women help only during the harvest of the crop beside that 86.7% of the farmers reported that extension services were not available. It was appeared that there was no significant effect of the age and education status on the adoption of the recommended cultural practices but the net annual income, family size, kind of the holding and the size of the holding had significant effect on some recommended cultural practices. The results of the study revealed that there was a relationship between some personal characteristics of the farmers and adoption of some recommended cultural practices and there was a problem with the distribution of the extension services in the state.

Keywords: Adoption, faba bean, personal characteristics, recommended cultural practices

العلاقة بين بعض الخصائص الشخصية للمزارعين وتبنى بعض العمليات الفلاحية الموصى بها لمحصول الفول المصري في مشروع السليم الزراعي – الولاية الشمالية

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هدفت هذه الدراسة لمعرفة العلاقة بين بعض الخصائص الشخصية لمزارعي مشروع السليم الزراعي وتبنيهم لبعض العمليات الفلاحية الموصى بها من قبل هيئه البحوث الزراعية لمحصول الفول المصري. أجريت الدراسة في مناطق القسمين الاول والثاني لمشروع السليم الزراعي. حجم العينة 60 مزارع. كان أسلوب الدراسة المستخدم هو المسح الميداني وأداة البحث المستخدمة هي الاستبيان لجمع المعلومات. تم اختيار عينات البحث بواسطة أسلوب العينات العشوائية. تم استخدام نظام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) حيث تم تحليل المعلومات باستخدام مربع كاي، النسب المئوية وتباين التوزيع التكراري للعينات. كانت متغيرات الدراسة هي الخصائص الشخصية للمزارعين من حيث النوع والعمر ومستوى التعليم وصافي الدخل السنوي اضافة لنوع الحيازة وحجمها وتوفر الخدمات الارشادية والعمليات الفلاحية الموصى بها لمحصول الفول المصري من حيث تحضير الأرض وتاريخ الزراعة وطريقة الزراعة ومعدل التقاوي وعدد الريات والفترة بين الريات ومواعيد الحصاد. من أهم النتائج التي توصلت اليها الدراسة أن كل المزارعين من الذكور ومشاركة المرأة فقط في عملية الحصاد وخاصة في محاصيل التوابل وأيضا أكد 86.7% من المزارعين عدم توفر خدمات الارشاد الزراعي. أيضاً اتضح من النتائج أنه لا يوجد تأثير معنوي للعمر ومستوي التعليم على تبني بعض العمليات الفلاحية الموصى بها بينما يوجد تأثير معنوي لمستوى الدخل وحجم الاسرة ونوع وحجم الحيازة على تبني بعض العمليات الموصى بها. توصلت الدراسة الي أن هناك علاقة بين بعض الخصائص الشخصية للمزارعين وتبنى بعض الحزم التقنية الموصى بها.

Introduction

Faba bean (*Vicia faba L*) is a significant crop worldwide, ranked as the fourth important grain pulses after dry bean, dry peas and chick peas. It is one of the important annually produced crops in River Nile and Northern States (Sudan Trade Point 2015). It makes up a major part of the daily diet of the population particularly in urban areas where the average per capita consumption was found to be 2.25 Kg/month. It also plays an important role in sustaining the productivity of the farming system through the atmospheric nitrogen fixation (Ahmed and Khalid, 2007). Its products are cheap source of high quality protein in the human diet (Kumari and Vanleur, 2011). Siliam, in Northern State of Sudan, is famous for the production of good quality faba bean. In Siliam, Salih and Ali (1989) reported mean yield of 3.01ton/ha (variety Sm-L).

Bohlen *et al.* (1969) stated that two interrelated processes help to bring new ideas from their sources of initial development to acceptance by farmers. These processes are called diffusion and adoption.

According to Rogers (2003) diffusion is a process in which an innovation is communicated through certain channels over time among the members of a social system, and it occurred between persons while adoption is a decision made by an individual to make full use of an innovation as the best course of action available. He defined innovation as an idea, practice, or object that is perceived by individuals or other units of adoption to be new. He also stated that there are four main elements in the diffusion of innovation which includes: the innovation, communication channel, time and the social system. Social system as an important element in diffusion of innovation was highlighted in early studies. For example, Linton (1952) reported that if we know what society culture is including in its particular system of values and attitudes, we can predict with a fairly high degree of probability whether that bulk of it welcome or resist a particular innovation. This statement shows the importance of cultural values on individual innovations. A social system with modern norms is more technologically developed, cosmopolite and literate and rational than a social system with traditional norms. Oladele (2005) argued that social scientists investigating farmers' adoption behavior have accumulated considerable evidence showing that demographic variables, technology characteristics, information sources, knowledge, awareness, attitude, and group influence affect adoption behavior.

Rolling (1988) mentioned that the diffusion process leads to inequitable development unless preventive measures are undertaken. He argued that the tendency of diffusion process to enhance inequity is reinforced by government rural development agencies which follow progressive farmer's strategy.

Rogers (2003) stated that the adoption of innovation is related to innovation decision process through which an individual passes from first knowledge of an innovation, to forming an attitudes towards the innovation, deciding to adopt or reject the innovation, implementing the new ideas, and confirming the innovation decision. Accordingly, he developed a model that explains the process which consists of five stages that include: awareness, interest, evaluation, trial and adoption stage. The distribution of adopters based on innovation assumes a normal distribution which is divided into five categories that include the innovators, early adopters, late adopters, late majority and the laggards.

The objective of this study is to determine the relationship between some personal characteristics of farmers of two blocks in Siliam Scheme in Northern state and adoption of some recommended faba bean (*Ficia feba*) cultural practices. More specifically, the study aims to determine the relationship between age, education level, annual income, family size, type and size of holdings of farmers and farmers' adoption of the recommended cultural practices namely, land preparation, sowing date, method of sowing, seed rate, number of irrigation, irrigation interval, and period of harvest.

Methodology

Random sampling technique was used to select the sample of the study. Accordingly, a group of 60 of the faba bean farmers' were selected from two blocks of Siliam scheme which is one of the important schemes of the Northern State, Sudan. A structured questionnaire was administered to the 60 randomly selected farmers from the study area. Personal interviews were used during a field survey which was conducted for collection of the primary data. The survey was carried out during the season of 2014. Secondary data were collected from reports, documents, journals and books.

Statistical Package for Social Sciences (SPSS) was used for analysis. Descriptive statistic was used to determine frequency and percentages of personal characteristics of the farmers and adoption of the recommended cultural practices of faba bean. Chi-square test was used to determine the relationship between personal characteristics and the adoption of the recommended cultural practices of faba bean.

Results and Discussion

Personal characteristics of the farmers

Table (1) showed that all of the respondents were males. This is one of tradition of the people in the Northern State, farms are owned by males and women contribution is limited compared to

other regions in Sudan. However, now a days, women start to share in the harvest of all the crops especially the spices crops. From the same table we noticed that most of the farmers were literate and young. Also 66.7% of the farmers have medium family size (5 -10 members) and more than half of the farmers, (55%) owned the farms. The vast majority of the farmers (86.7%) said that the extension services were not available so they depend on their own knowledge and other sources of information. In addition, 46.7% of the farmers stated that their holdings are between 5 – 10 feddans.

Table 1: Frequency and percent distribution of personal characteristics of farmers

Item	frequency	%	Item	Frequency	%
Sex			Education		
Male	60	100	Illiterate	3	5.0
Female	00	00	Literate	57	94.9
Total	60	100	Total	60	100
Age			Family size		
Less than 30	22	36.5	Less than 5	17	28.4
30 -39	16	26.7	5-10	40	66.7
40 and above	22	3.7	above 10	3	5.0
Total	60	100	Total	60	100
Income/SDG			Type of holding		
Less than 5000	13	21.7	Owned by farmer	33	55
5000-10000	16	26.7	Government	4	6.7
Above 10000	31	51.6	Rented	19	31.7
Total	60	100.0	Sharecropping	4	6.7
Extension			Total	60	100.0
A viable	8	14.3	Farm size/feddan		
Not available	52	86.7	Less than 5	14	23.4
Total	60	100.0	5-10	28	46.7
			Above 10	18	30
			Total	60	100

Association between age and adoption of recommended cultural practices:

Table (2) shows that there is no significant association between age and adoption of all of the recommended faba bean cultural practices. This seems to be in line with the research result of Abass (2006) who found that there were no significant differences between farmers of different groups of ages and their adoption of recommended cultural practices of cotton in Gezira scheme. Age seems to have limited or no effect on adoption of recommended cultural practices. In reviewing research of characteristics of adopter categories, Rogers (2003) found that early adopters are not different from later ones in age.

Table 2: Chi-square test for association between age and recommended Faba bean cultural practices

Recommended cultural practices	Percentage of holders				Sig.
	Age				
	Less than 20	20-29	30-39	40 and above	
Land preparation	5.6	28.3	26.4	39.6	0.682
Sowing date	8.0	27.3	31.8	40.9	0.581
Method of sowing	6.9	27.9	39.8	40.9	0.877
Seed rate	00	25.0	25.0	50.0	0.415
No. of irrigations	6.0	27.3	39.45	33.3	0.530
Irrigation interval	6.7	33.3	36.7	30.0	0.693
Period of harvest	5.0	34.2	28.9	36.8	0.395

Association between education level and adoption of recommended Faba bean cultural practices:

Table (3) shows that there is no significant association between education level and all of the recommended faba bean cultural practices under investigation. This is not in line with what Abass (2006) mentioned as what is common in diffusion- adoption research. He stated that diffusion adoption- research indicated that those who have higher education levels are more responsive to new ideas than those with lower education levels.

Table 3: Chi-square test for association between education level and adoption of recommended Faba bean cultural practices

Recommended cultural practices	Education (%)					Sig.
	Illiterate	Khalwa	Primary	Secondary	High education	
Land preparation	2.1	4.3	48.9	38.3	3.4	0.395
Sowing date	2.1	4.3	4.78	39.1	6.5	0.651
Method of sowing	4.4	4.4	48.8	36.6	6.7	0.293
Seed rate	00	00	25.0	50.0	25.0	0.691
No. of irrigations	2.9	00	50.0	38.2	8.8	0.388
Irrigation interval	6.4	00	50.0	34.4	9.4	0.729
Period of harvest	2.3	2.3	48.8	32.6	9.3	0.071

Association between annual income and adoption of recommended Faba bean cultural practices:

Table (4) shows that there is significant association between net annual income and land preparation, seed rate and irrigation interval while there is no significant association between net annual income and the other cultural practices under the study. Sarker *et al.* (2009) found that

farmers with higher income are more likely to adopt risky technology compared with those with low income.

Table 4: Chi-square test for association between annual income level and adoption of recommended faba bean cultural practices

Recommended cultural practices	Percentage of holders			Sig.
	Annual income (SDG)			
	Less than 5000	5000 and less than 10000	10000 and above	
Land preparation	00	29.4	70.6	0.000
Sowing date	00	33.3	66.7	0.328
Method of sowing	00	24.4	75.6	0.456
Seed rate	00	50.0	50.0	0.032
No. of irrigations	00	38.2	61.7	0.375
Irrigation interval	00	13.35	86.7	0.026
Period of harvest	00	30.0	70.0	0.113

Association between family size and adoption of recommended Faba bean cultural practices:

Table (5) shows that there is significant association between family size and number of irrigation and the period of harvest while there is no significant association between family size and land preparation, sowing date, seed rate and irrigation interval. Arene (1994) reported a positive and significant relationship between family size and adoption of recommended cultural practices. However, Voh (1982) established that household size is not significantly related to adoption.

Table 5: Chi-square test for association between family size and adoption of recommended faba bean cultural practices

Recommended cultural practices	Percentage of holders			Sig.
	Family size			
	Less than 5	5 – 9	10 and above	
Land preparation	39.1	52.1	8.7	0.319
Sowing date	37.8	53.3	8.9	0.345
Method of sowing	34.1	56.8	9.1	0.715
Seed rate	00	100	00	0.144
No. of irrigations	37.1	57.1	5.7	0.003
Irrigation interval	40.6	56.3	3.1	0.146
Period of harvest	37.5	52.5	10.0	0.007

Association between kind of the farm and adoption of recommended Faba bean cultural practices:

Table (6) shows that there is significant association between kind of the farm and land preparation, seed rate and irrigation interval while there is no significant association between net annual income and the other cultural practices under the study.

Table 6: Chi-square test for association between kind of the farm and adoption of recommended faba bean cultural practices

Recommended cultural practices	Percentage of holders				Sig.
	Type of holding				
	Owned	Governed	Rented	Shared	
Land preparation	34.0	6.0	34.0	26	0.003
Sowing date	32.6	10.9	28.3	28.3	0.447
Method of sowing	29.5	11.4	29.5	29.5	0.251
Seed rate	50.0	25.0	00	25	0.009
No. of irrigations	36.1	8.3	25.0	30.6	0.645
Irrigation interval	50.0	00	16.7	33.3	0.010
Period of harvest	41.5	7.3	24.4	26.8	0.107

Association between farm size and adoption of recommended faba bean cultural practices:

Table (7) shows that there is significant association between the size of the farm and sowing date and no. of irrigations while there is no significant association between the size of the farm and the other cultural practices under the study. Abdul *et al.* (1993) reported a significant relationship between landholdings (farm size) and adoption.

Table 7: Chi-square test for association between farm size and adoption of recommended Faba bean cultural practices

Recommended cultural practices	Percentage of holders			Sig.
	Size of holding (fd)			
	Less than 5	5-10	More than10	
Land preparation	19.6	56.5	23.9	0.206
Sowing date	19.5	53.6	26.8	0.001
Method of sowing	16.7	57.1	26.2	0.298
Seed rate	75.0	00	25.0	0.128
No. of irrigations	25.0	34.8	31.3	0.023
Irrigation interval	20.7	55.2	24.1	0.842
Period of harvest	13.5	56.8	29.7	0.507

Conclusion:

Results showed that all the farmers were male and the women help only during the harvest of the crops. There was no significant effect of the age and education status on the adoption of the recommended cultural practices but the net annual income, family size, kind of the holding and the size of the holdings were found to have significant effect on adoption of some recommended cultural practices. Further, there was a problem with the distribution of the extension services in the state.

References

- Abass, E.A. (2006). Relationship of some personal characteristics of Tenants and the adoption of some recommended cotton cultural practices in the centre Group, Gezira Scheme, Sudan. MSc Thesis, University of Gezira.
- Abdul, R.Q.; Ashfaq, H.M. and Sultan, A.C. (1993). Farmers characteristics affecting adoption of agricultural innovations. *Journal of Rural Dev. and Admin.* Vol. xxv, (3): 111 – 113
- Ahmed, E.M.; Abubaker, M. and Khalid, S. (2007). Economics of faba bean production and marketing in northern Sudan. Conference on International Agricultural Research for Development, University of Kassel-Witzenhausen and University of Göttingen, October 9-11, 2007, Tropentag, Germany.
- Arene, C.J. (1994). Discriminant analysis of small holder farmer adoption potential and the prediction of extension cost in Nigeria: a comparative enterprise perspective. *Journal of Extension System*, 10 (1): 46–58.
- Bohlen, G; Conphenous, C.; Milton, C.; Lionberger, H. and Rogers (1969). Adopters of new ideas. North Central Regional Extension publication. No.13-New Yourk, U.S.A.
- Kumari, S.G. and Van Leur, J.R.G. (2011). Viral disease infecting faba bean (*Vicia faba*). The Magazine of European Association for grain legume research, Issue No. 56
- Linton, R. (1952). Cultural and personality factors affecting economic growth. In: B.E Hoselitz (ed); *The progress of underdeveloped areas*. University of Chicago press.
- Oladele, O.I. (2005). Atobit analysis of propensity to discontinue adoption of agricultural technology among farmers in Southwestern Nigeria. *Journal of Central European Agriculture*, Vol. 6 (2005) No. 3

- Rogers E.M. (2003). *Diffusion of innovation (5th ed.)* New York: The free press
- Salih, H.S. and Ali A.E. (1989). A new faba bean cultivar for the Northern Province of the Sudan. *Fabis newsletter*, April
- Sarker, M.A.; Cithara, Y. and Hoque, M. (2009). Determinants of adoption decisions: The case of organic farming in Bangladesh. *Extension Farming Systems Journal*, Vol. 5 No. 2.
- Sudan Trade Point (2015). Faba bean (Broad bean). In Sudan Trade point, the electronic trade facilitation centre, Ministry of Trade, Khartoum, Sudan.
- Voh, J.P. (1982). A study of factors associated with the adoption of recommended farm practices in a Nigeria Village” *Agricultural Administration* 2: 17 – 27.

