Examining the Effects of Farmer Field School (FFS) Approach in Management of Knowledge and Information System in Khuzestan

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Abstract

The purpose of this study was to evaluate the effect FFS approach on the agricultural knowledge and information system in Khuzestan. Regarding the purpose, the study is applied and in terms of data collection, it is a non-experimental study. The population of the study was all the farmers taking part in School in the Farm programs in Shush, Dezful and Shushtar in 2014 (N=755). The sample size was estimated using Cochran's formula (n=113). In order to compare the level of information and knowledge management, exactly this number of questionnaires were completed and collected from the farmers who did not participate in FFS. Sampling method was stratified with proportional allocation for the three cities in Khuzestan. The main tool for collecting research variables was questionnaire. To determine the validity, face validity was used. In order to determine the reliability of the research tool, Cronbach's alpha value was calculated and reliability of the research tool was obtained, the questionnaire of the survey with 0.832 total alpha has reliability. The results obtained showed that there is a significant negative relationship between agricultural work experience and knowledge and information management. There is a significant positive relationship between the extent of social participation and using information resources with information and knowledge management. Participants in the management of knowledge and information course have more information than people who do not. The results of studying factors affecting knowledge and information management indicated that in the first step the use of information resources variable has entered the model. This variable has the ability to explain 21.6% of the variance. In the second step, agricultural work experience variable has entered the equation. This variable has increased multiple correlation coefficient to 0.581 and coefficient of determination to 0.338. In the third step, social participation variable has entered the equation. Three variables entered have the ability to explain 37.8 percent of the changes of the dependent variable.

Keywords: knowledge and information management, FFS approaches knowledge and information system.
Introduction

Agricultural extension is an education system whose aim is to improve knowledge, insight and skills of farmers and ultimately to create changes in their behavior. This system is intended to achieve the above goal using efficient methods and approaches (Khademi, 2003). FSS approach is one of the participatory approaches in agricultural extension that by creating a two-way interaction with farmers and by putting farmers as the core in the process of education brings about a dynamic and creative learning environment in the workplace and operators' plant (Partou Azam, 2004).

This approach helps the compatibility of activities and the results of research system, extension and development of agriculture with the actual conditions of farmers and rural communities by focusing on the participation of farmers. And by institutional coordination, integration of activities, planning, implementation and evaluation of programs under the conditions of farmers, and by using local resources helps reduce inefficiencies in the use of critical resources of extension and research systems and brings about an opportunity for these systems to allocate their resources more effectively (Lahmar, 2010).

In the past decades, to increase the efficiency and for more role of farmers in the process of information and knowledge system, experts and specialists in agricultural knowledge transfer have offered participatory and farmer-based approaches to the research, extension and education systems and have taken action to apply it in different countries. In response to the problems mentioned above, experts in promotion, research and agricultural systems in the world are determined to offer affective approaches in the transfer of new technologies and effectiveness of knowledge management in the field of agriculture by examining research, extension and farmer interactions sub-systems (Bartlett, 2005).

Now, examining agricultural information and knowledge system in Iran shows many problems in the fields of producing knowledge and practical information, interaction and communication of system components, planning, and lack of motivation of human factors for presence in field operation units and so on. In examining the problems of Iran's agricultural information and knowledge system, the following points can be posed:
- Lack of consistency of technology with real situations of beneficiaries,
- Focus on research-orientation,
- Lack of attention to the priorities and the real needs of beneficiaries;
- The interval between production and transfer of technology (Norouzi and Amirhosseini, 2003).

In the meantime, the adoption of an efficient approach can be effective on the transfer and sharing of knowledge among farmers. FFS approach, as a participatory approach, has been considered in recent years in Khuzestan, whose impact on agricultural knowledge and information system is unclear. Therefore, the main issue of the study is to investigate the effect of FFS approach on knowledge and information system in Khuzestan.
Rolling (1989) introduced Agricultural Knowledge and Information System (AKIS) as a set of agricultural organizations or individuals, links and the interactions between them that cooperate in the processes of creating, modifying, transmission, storage, retrieval, integration, dissemination, and application of knowledge and act to support decision-making, problem solving and innovation in the agriculture of a country or a region.

Damtie Endalew (2009) showed that the implementation of the approach has a role in creativity and the creation of social networks for the exchange of knowledge and experience between individual members of FFS. Mancini et al. (2006) came to the conclusion that there is a significant difference between the level of education and the use of pesticides, ecological knowledge and decision-making power in the two groups of farmers who participated in the approach and the ones who did not, and the use of pesticide among farmers who participated in the approach reduced.

Davis et al. (2009) showed that FFS approach, in learning tools, participants' experience has had a positive effect in the approach. In all participants, changes were created in their thinking about empirical agricultural issues.

Praneet Atakul and Weibel (2003) concluded that there is a significant difference between the knowledge and the use of pesticides in rice farmers who participate in FFS approach and the ones who did not. Zuger (2004) concluded that the farmers participating in FFS approach have more knowledge than farmers who do not. Farmers participating in FFS approach have the potential to significantly improve productivity in potato production compared to the ones who do not. Farmers participating in FFS approach have used fewer pesticides compared to the ones who do not. David et al. (2006) concluded that farmers participating in FFS approach have higher technical knowledge compared to the ones who do not. FFS approach has brought about social cohesion, strengthening one's social skills through the exchange of knowledge and improving farmers' confidence and the ability to work among farmers participating in the approach.

Asiabak (2002) reached the conclusion that there is a significant relationship between the implementation of FFS approach and identifying and solving the problems of farmers participating in the approach. There is a significant relationship between implementation of developmental designs and participation of farmers in FFS approach. Reddy and Superman (2005) concluded that there is a significant relationship between the implementation of FFS approach and knowledge, teamwork and transfer of agricultural information from one farmer to another. There is a significant relationship between the implementation of FFS approach and enhancing the ability of farmers in business activities and improving integrated pest management. Erbaugh et al (2007) concluded that there is a significant relationship between FFS approach and the number of working hours in the farm. There is a significant relationship between participating in FFS approach with the income of farmers, production practices compatible with the environment and teamwork. Kristin and Workneh (2007) found the results that there is a significant relationship between the implementation of integrated pest management and knowledge of farmers. Implementation of integrated pest management with FFS approach improves three aspects. The ability of farmers for planning activities to improve productivity of agribusiness, adoption of new information technology, teamwork, implementation of integrated pest management with FFS have good influence in improving adoption of average integrated pest
management methods of farmers. Implementation of integrated pest management with FFS approach has a good influence to improve the dissemination of integrated pest management in farmers participating in the approach.

Nonaka and Konno (2009) showed that the impact of climate change for rice cultivation systems for most poor farmers is enormous. FFS plays an important role in the management of fragile ecosystems and providing communities with basic understanding to deal with changing ecosystems.

Witte et al. (2006) carried out research entitled "Training intensity and dissemination of information by FFS in Senegal. By analyzing age, gender, acreage, property systems, social status and level of technology adoption, and participation in the approach reached the conclusion that there is a significant difference between gender, age, acreage, property systems, social status and the level of adoption acceptance in the two groups of farmers (participating in the approach and those who do not).

Materials and Methods

Regarding the purpose, this study is applied and in terms of collecting data is non-experimental and correlational that studies the relationship between variables. Dependent variable of the study was the level of function of knowledge and information. The independent variables of the study are demographic, social, economic, educational characteristics of the respondents and participation in FFS. The population of the study was all the farmers taking part in School in the Farm programs in Shush, Dezful and Shushtar in 2014 (N=755). The sample size was estimated using Cochran's formula (n=113). In order to compare the level of information and knowledge management, exactly this number of questionnaires were completed and collected from the farmers who did not participate in FFS. Sampling method was stratified with proportional allocation for the three cities in Khuzestan. The main tool in data collection was questionnaire. To determine the validity, face validity was used. In order to determine the validity and make revisions, the questionnaire was given to a panel of experts. In order to determine the reliability of research tool, after distribution of 30 questionnaires as the initial test, Cronbach's alpha values were calculated for different sectors and the reliability of research was established, the questionnaire of the survey with a total alpha 0.832 has reliability.

Research results

- Examining the relationship between research variables and agricultural information and knowledge management: Examining the relationship between research variables and agricultural information and knowledge management indicated that there is a significant negative relationship between history of farming and management of knowledge and information at 0.05 level of confidence. There is a positive and significant relationship between social participation and management of knowledge and information at 0.01 level of confidence. There is a positive and significant relationship between the use of information resources and management of knowledge and information at 0.01 level of confidence. Results are given in Table 1 below.
Table 1: Examining the relationship between predictor variables and agricultural information and knowledge management

<table>
<thead>
<tr>
<th>Row</th>
<th>Predictor variable</th>
<th>Criterion variable</th>
<th>r</th>
<th>Test result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>Agricultural information and knowledge management</td>
<td>-0.091</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td></td>
<td>0.009</td>
<td>Rejected</td>
</tr>
<tr>
<td>3</td>
<td>Agricultural work experience</td>
<td></td>
<td>-0.191**</td>
<td>Confirmed</td>
</tr>
<tr>
<td>4</td>
<td>Acreage</td>
<td></td>
<td>0.076</td>
<td>Rejected</td>
</tr>
<tr>
<td>5</td>
<td>The number of cultivated crops</td>
<td></td>
<td>0.001</td>
<td>Rejected</td>
</tr>
<tr>
<td>6</td>
<td>Income</td>
<td></td>
<td>0.029</td>
<td>Rejected</td>
</tr>
<tr>
<td>7</td>
<td>Social status</td>
<td></td>
<td>0.053</td>
<td>Rejected</td>
</tr>
<tr>
<td>8</td>
<td>Social participation</td>
<td></td>
<td>0.170*</td>
<td>Rejected</td>
</tr>
<tr>
<td>9</td>
<td>The use of information resources</td>
<td></td>
<td>0.196**</td>
<td>Confirmed</td>
</tr>
</tbody>
</table>

(** and * are, respectively, significance level and level of confidence 0.01, 0.05)

- **Average comparison:** Studying the results obtained from comparing individual, social, economic characteristics in two groups of farmers participating in FFS periods and the ones who did not showed that the farmers' age in the two groups of farmers has a significant difference at 0.01 confidence level. Participants in the period are younger than the ones who did not. The history of agriculture in the two groups had a significant difference at 0.01 level of confidence. People not participating in the period were significantly more experienced than those did. Checking the size of the land between the two groups showed no significant difference between the two groups in terms of the size of the land. Comparing the social status of the two groups showed no significant difference between the two groups in terms of social status, but in terms of social participation the two groups have significant differences. Comparing the two groups in terms of the use of information sources shows that people participating significantly use more resources, and this difference is significant at 99 percent level of confidence. Studying the amount of knowledge and information management among farmers showed that people participating in the period have more management of knowledge and information than people who did not. Results are shown in Table 2 below.

Table 2. Comparison of individual, social, economic characteristics of respondents in the period

<table>
<thead>
<tr>
<th>Variable</th>
<th>Second job</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Participated</td>
<td>42.91</td>
<td>14.94</td>
<td>2.63</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>Not participated</td>
<td>47.84</td>
<td>13.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>job experience</td>
<td>Participated</td>
<td>19.41</td>
<td>12.33</td>
<td>4.695</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Not participated</td>
<td>27.23</td>
<td>12.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The size of land</td>
<td>Participated</td>
<td>12.19</td>
<td>6.35</td>
<td>1.333</td>
<td>0.184</td>
</tr>
<tr>
<td></td>
<td>Not participated</td>
<td>11.01</td>
<td>6.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Participated</td>
<td>43.98</td>
<td>38.77</td>
<td>0.082</td>
<td>0.935</td>
</tr>
<tr>
<td></td>
<td>Not participated</td>
<td>42.69</td>
<td>34.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social status</td>
<td>Participated</td>
<td>17.30</td>
<td>3.35</td>
<td>0.839</td>
<td>0.402</td>
</tr>
<tr>
<td></td>
<td>Not participated</td>
<td>16.95</td>
<td>2.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Regression analysis: In this part, multiple regression analysis is used to examine the impact of the independent variables on the dependent variable, level of knowledge management and information. In this part, the purpose is to measure the impact of each of the independent variables on the dependent variable level of knowledge management and information and to predict the dependent variable changes and to determines the share of each of the independent variables in explaining variance. To investigate the factors affecting the level of agricultural information and knowledge management, the variables were put in stepwise regression model. Summary of the results of regression analysis is given in tables (3) and (4).

Table 3: Factors affecting the level of information and knowledge management with values of coefficients

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>R</th>
<th>R²</th>
<th>R²_Adj</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The use of information resources</td>
<td>0.472</td>
<td>0.233</td>
<td>0.216</td>
<td>32.67**</td>
</tr>
<tr>
<td>2</td>
<td>Agricultural work experience</td>
<td>0.581</td>
<td>0.338</td>
<td>0.326</td>
<td>28.81**</td>
</tr>
<tr>
<td>3</td>
<td>Social participation</td>
<td>0.628</td>
<td>0.394</td>
<td>0.378</td>
<td>24.26**</td>
</tr>
</tbody>
</table>

According to the results obtained, it is seen that in the first step, the use of information resources is entered into the model. The correlation coefficient (R) of this variable 0.472 and its adjusted determination coefficient (R²) is equal to 0.216. In other words, this variable has the ability to explain 21.6 percent of the changes of the dependent variable. In the second step of the analysis, agricultural work experience has entered the equation. This variable has increased multiple correlation coefficient to 0.581 and coefficient of determination to 0.338. Therefore, two mentioned variables have the ability to explain 32.6 percent of the changes of the dependent variable. In the third step, social participation has entered the equation. By entering this variable, multiple correlation coefficients has increased to 0.628 and coefficients of determination to 0.394. So all three variables entered have the ability to explain 37.8 percent of the dependent variable. After entering these three variables the operations stopped and the sum of these variables explained 37.8 percent of the dependent variable. The coefficients related to variables entered into the regression model are shown in Table 4.

Based on the results of the β coefficient, it is observed that the variable of use of sources (β=0.410) affects the agricultural information and knowledge management and after this social participation variable (β=0.243) has the greatest impact on agricultural information and
knowledge management. Moreover, agricultural work experience variable with -0.160 has a negative impact on agricultural information and knowledge management.

Table 4. The extent of effect of affecting variables on the level of agricultural information and knowledge management

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>B</th>
<th>Beta</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>86.68</td>
<td>3.81</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>The use of information resources</td>
<td>0.949</td>
<td>0.410</td>
<td>5.25</td>
<td>0.00</td>
</tr>
<tr>
<td>Agricultural work experience</td>
<td>-0.002</td>
<td>-0.160</td>
<td>2.02</td>
<td>0.046</td>
</tr>
<tr>
<td>social participation</td>
<td>18.16</td>
<td>0.243</td>
<td>3.36</td>
<td>0.001</td>
</tr>
</tbody>
</table>

According to non-standardized coefficients, the regression equation can be written as:
\[ y = 86.68 + 0.949x_1 - 0.002x_2 + 18.16x_3 \]

Regression equation based on standardized beta coefficients is as follows:
\[ y = 86.68 + 0.410x_1 - 0.160x_2 + 0.243x_3 \]

**Conclusion and Discussion**

The results of this study show that, the use of information resources has a significant positive effect in agricultural information and knowledge management and this result is consistent with the results of Oskou and colleagues (2008). The results of the study by Dinpanah and colleagues (2009) showed that the use of sources of information is effective on agricultural information and knowledge transfer, which is consistent with the results of this research. Studying the economic variables such as income and property type showed that these variables are not associated with agricultural information and knowledge management. These results are not consistent with the results of Ooi and Kenmore (2005).

In the study by Mancini et al (2007) conducted in India, it was concluded that the financial capital (income, loans, etc.) in farmers who had participated in FFS is higher. The results showed no significant difference between the land size and income between the two groups. The results showed that education level as one of the individual characteristics of the respondents' does not have a significant impact on the participation of farmers in agricultural information and knowledge management, which is consistent with results of the study by Dinpanah (2007). The results showed that there is a significant negative relationship between the history of farming and management of knowledge and information. The results of the research are consistent with the studies by Oskou et al. (2008), Etehadi et al. (2009), Ajayi (2001), Erbaugh et al. (2007) and Witt et al. (2006). The results showed that there is a positive and significant relationship between social participation and management of knowledge and information.

As the social participation increases, the level of agricultural information and knowledge management of respondents increases as well. The results of the research are consistent by the findings of Dinpanah and colleagues (2009), Eteheadi et al. (2009), David et al. (2006) and Reddy and Surymani (2005). There is a significant positive relationship between the use of information resources and information and knowledge management. As the use and exploitation
of information resources is more, farmers have better management over their knowledge. The results of the research by Zuger (2004) and Reddy and Surymani (2005) are consistent with this. Regression analysis results showed that the use of information resources has the most effect on agricultural information and knowledge management. The results of Witt et al. (2006), Kristin and Workneh (2007), Reddy and Surymani (2005) and Etehadi et al. (2009) confirm this.

Suggestions

- The results suggest a significant impact of the use of information resources on agricultural information and knowledge management, so it is recommended that in the first step appropriate information channels be identified and in the second step by needs assessment, proper content be given to farmers,
- The results showed that there is a significant negative correlation between agricultural work experience and knowledge and information management, thus it is recommended that in the implementation of the approach more experienced farmers be considered more and be involved in the program,
- The results showed that there is a positive and significant correlation between social participation and management of knowledge and information, so it is recommended that by delegating more activities related to the management of village and city, as well as the trade and social organizations, farmers participation be increased
- The results showed that there is a positive and significant correlation between the use of farm laborers and attending courses, so it is recommended that farmers willing to use fewer farm laborers be considered more in FFS approach,
Farmers who are younger are more likely to participate in FFS periods, therefore, it is recommended that the elderly farmers be considered in this approach,
- The results showed that participating people significantly use information resources, so it is recommended that the access of other non-participating farmers be facilitated. For this purpose, subject specialists should have more connections with farmers,
- The promotion system of the region has been studied from different aspects especially environmental factors including opportunities and threats, as well as factors internal and external to the organization and challenges ahead, so it is recommended that a systematic move be done for the effect of the promotional programs appropriate to the economic and social conditions of farmers and FFS operations.
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