

Sustainable Agriculture Extension System in Khuzestan Province, Iran (Goals, Contents, Organization and Extension agents)

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Abstract: The purpose of this study was determining favorable goals and contents of sustainable agricultural extension system in Khuzestan province, Iran. Extension experts of Agricultural-Jihad organization in Khuzestan province were considered as a statistical population (N=120). All individuals were investigated. After confirm the validity of the instrument by panel of experts, to determine the reliability coefficient using Cronbach alpha coefficients were obtained for all sections of the questionnaire over 0.7 were calculated. Method of research was descriptive and correlative. Based on the results, the most important goals of extension system for supporting sustainable agriculture were: increasing knowledge and skills of sustainability, increasing productivity and efficiency, health development, technology transfer and development of food security. Also, the results that indicated the most important extension contents were: development of organic farming, development of biological control, food security contents, development of integrated management and considering crop yield. In addition, the most important characteristics that have been recommended and agricultural extension organizations must consider were: interaction communication, systematic management, occupations quality, and horizontal communication. Based on the results, the most important experts characteristics were: skills of information presentation, knowledge of adult education, knowledge of information technology, and knowledge about sustainable agriculture. Based on regression the results also showed that favorable goals, contents, organization and extension agents can explain 48% of variance of dimensions of sustainable agriculture.

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Keywords: Extension system, sustainable agriculture, Extension expert

1. Introduction

There are widespread viewpoints about the environmental effect of agricultural practices and technologies and over the long-term sustainability of farming systems in Asia (Garforth and Lawrence, 1997). Concern about the future generations was the main reason for changes occurred in development paradigm in the late 1980s. According to Wattenbach and Friedrich (1997), these concerns have received worldwide attention. These authors defined sustainable development as a development that meets the need of the present without compromising the ability of the future generation. Obviously, the challenges facing policymakers and producers is to increase agricultural productivity and thus ensure food security, while enhancing the productive capacity of natural resource base in a sustainable manner (Ommani, 2001).

During the past fifty years, agricultural development policies have emphasized external inputs as driving forces to increase food production. This has led to growth in global consumption of pesticides, inorganic fertilizer, tractors and other machinery (Chizari, Ommani & Noorivandi, 2006). These external inputs have substituted for natural

processes and resource, rendering them less powerful. Pesticides have replaced biological, cultural, and mechanical methods for controlling pests, weeds, and diseases; inorganic fertilizers have substituted for livestock manures, composts, and nitrogen-fixing crops.

These processes have caused conditions that resulted unsustainability in agriculture. A necessary condition for sustainable agriculture is that large number of farmer must be motivated to use, their resource in a coordinated manner. Thus, the success of sustainable agriculture depends on motivations, skills, knowledge and action taken by groups or communities as a whole (Roling and Pretty, 1997).

Agricultural extension and education is considered an essential factor in development of agricultural programs (Shahbazi, 1996). Agricultural extension and education has economic impact and sustainability in agriculture by providing information (Evenson, 1997 p. 29).

Agricultural extension is a public service for human resource development (HRD) in the agricultural sector (Van den Ban and Hawkins, 1996). Multiple studies in Iran showed that, although extension services has played a positive role in

agricultural development of Iran, but there are difficulties, barriers, misunderstandings, and weaknesses in the transfer of new technology and information to farmers (Ommani and Chizari, 2002). Lacking the suitable linkage between extension and research organizations has been a barrier for transfer of appropriate new technology to farmers (Shahbazi, 1996). Identifying favorable goals and contents of sustainable agricultural extension system in

Khuzestan province have important role to developing extension system.

Sustainable agriculture practices have tended to reduce the use of fertilizer, pesticides and maximal tillage world wide (Chizari, Ommani & Noorivandi, 2006). Sustainable resource management are related to practices which local human population use resource in sustainable manner (Chizari, Ommani & Noorivandi, 2006).

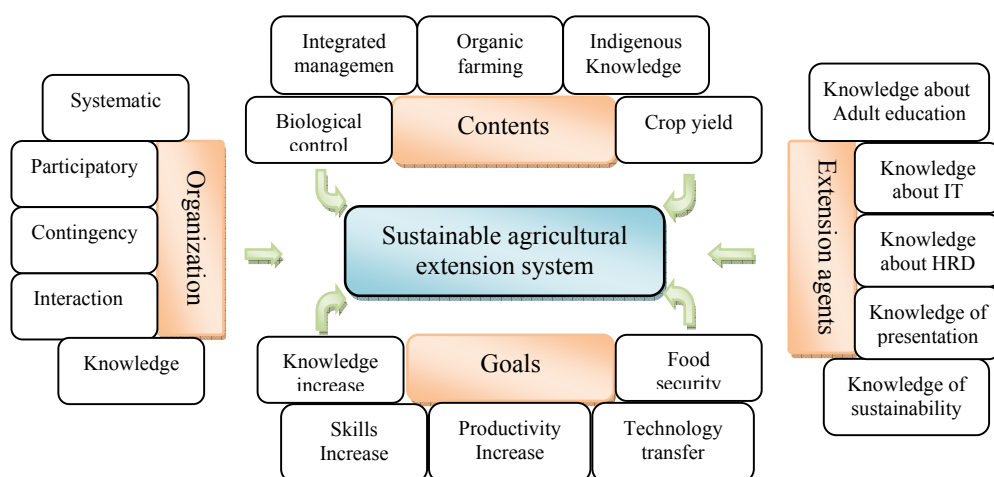


Table 1: Theoretical Framework

The success of sustainable agriculture depends on motivation, skills, and knowledge of farmers (Ommani, 2001). Extension programs have vital roles in this content. Extension can demonstrate the feasibility of sustainable practices. Consequently, sustainability is the successful management of resource to satisfy the challenging human needs, while maintaining or enhancing the quality of environment and conserving natural resource.

2. Material and Methods

From the viewpoint of classification of research based on objective, type of research is applied research. The research method is descriptive and correlative.

Through this method, a field study of library methods, data collection is done and the results obtained by percentage frequency, mean and variance are described. Researcher in the study investigates the correlation relationship between variables are explored. In this study Agricultural-Jihad organization in Khuzestan province as a case study organizations were selected. Extension experts in this organization, as the statistical community have been

considered that the whole community, including N=120 in the target audience as a community is considered. Return rate was 88%.

In order to validate research tools, panel of expert's method was used. Then collect the questionnaires and using the results of the opinions of experts and specialists, we have modified the questionnaire. A number of questionnaires in the next step modified using a number of contacts and complete research about the content and length of the questionnaire.

To determine the reliability of the questionnaire, 30 copies of the questionnaire in the Agricultural-Jihad organization of Tehran province has completed, then SPSS 16 software using Cronbach's coefficient alpha levels through questionnaire reliability was investigated. According to the results of questionnaire reliability levels are acceptable, and in all items over than 0.70.

3. Results and discussion

First, experts characteristics described and then discussed the inferential statistics are presented. This study showed that based on level of education, 85

percent of experts had B.Sc and low degree and 15 percent had M.Sc.

Extension goals for supporting sustainable agriculture

In this research, the agricultural extension experts were questioned about the importance rate of different extension goals for supporting sustainable agriculture by 5-point scale (1=very low, 2=low, 3=moderate, 4=high, 5=very high). Extension experts believed that among extension goals, increasing knowledge and skills of sustainability (M=4.34; SD=0.91), increasing productivity and efficiency (M=4.15; SD=0.98), health development (M=4.02; SD=1.01), technology transfer (M=3.40; SD=0.99) and development of food security (M=3.89; 1.14) had very high importance for supporting sustainable agriculture. These findings are supported by Ommani and Chizari (2002). Also they claimed that for successful and sustainable introduction, use and improvement of water control techniques and technologies farmers should be encouraged to analyze their problems, search for solutions, monitor and evaluate the selected and implemented techniques and technologies, and adjust them according to their constraints and opportunities. This issue is confirmed in the researches of Sivayoganathan and Mowjood (2003), Molden (2007).

Table 1: Importance of extension goals for supporting sustainable agriculture

Extension Goals	Mean	SD*	CV**	Rank
Knowledge and skills	4.34	0.91	0.209	1
Productivity/Efficiency	4.15	0.98	0.236	2
Health development	4.02	1.01	0.251	3
Transfer of technology	3.40	0.99	0.291	4
Food security	3.89	1.14	2.93	5
Crop yield	3.75	1.12	0.298	6
Quality of life	3.48	1.05	0.312	7
Social equality	3.30	1.09	0.329	8

Scale: 1=very low, 2=low, 3=moderate, 4=high, 5=very high

* Standard Deviation; ** Coefficient of Variation

Extension contents for supporting sustainable agriculture

In this research, the agricultural extension experts were questioned about the importance rate of different extension contents for supporting sustainable agriculture by 5-point scale (1=very low, 2=low, 3=moderate, 4=high, 5=very high). Extension experts believed that among extension contents, development of organic farming (M=4.02; SD=1.08), development of biological control (M=4; SD=1.08), food security contents (M=3.51; SD=1.06), development of integrated management (M=3.42; SD=1.10) and considering crop yield (M=3.08; 0.93)

had very high importance for supporting sustainable agriculture. This finding is supported by Allahyari and Chizari (2008).

Table 2: Importance of extension contents for supporting sustainable agriculture

Extension Contents	Mean	SD*	CV**	Rank
Organic farming	4.02	1.08	0.269	1
Biological control	4.00	1.08	0.270	2
Food security	3.51	1.06	0.302	3
Integrated management	3.42	1.10	0.321	4
Crop yield	3.09	0.99	0.322	5
Farming control	3.28	1.08	0.330	6
Indigenous knowledge	2.97	0.99	0.333	7

Scale: 1=very low, 2=low, 3=moderate, 4=high, 5=very high

* Standard Deviation; ** Coefficient of Variation

Extension organization characteristics for supporting sustainable agriculture

Extension experts believed that among extension organization characteristics, interaction communication (M=3.69; SD=1.04), systematic management (M=4; SD=1.08), occupations quality (M=3.51; SD=1.06), and horizontal communication (M=3.49; 0.97) had very high importance for supporting sustainable agriculture. This finding is supported by Allahyari and Chizari (2008).

Table 3: Importance of extension organization characteristics for supporting sustainable agriculture

Extension Organization	Mean	SD*	CV**	Rank
Interaction communication	3.69	1.04	0.258	1
Systematic management	4.00	1.08	0.265	2
Occupations quality	3.51	1.06	0.270	3
Horizontal communication	3.49	0.97	0.277	4
HRD	4.00	1.11	0.284	5
Local groups	4.00	1.12	0.286	6
Participatory management	3.41	1.03	0.302	7
Hierarchy	2.97	0.99	0.333	8
Contingency management	2.68	0.98	0.366	9

Scale: 1=very low, 2=low, 3=moderate, 4=high, 5=very high

* Standard Deviation; ** Coefficient of Variation

Extension agent's characteristics for supporting sustainable agriculture

Extension experts believed that among extension agents characteristics, skills of information presentation (M=3.31; SD=0.89), knowledge of adult education (M=3.20; SD=0.90), knowledge of information technology (M=3.21; SD=0.90), and knowledge about sustainable agriculture (M=3.20; 0.90) had very high importance for supporting sustainable agriculture.

Regression Analysis

According to the regression coefficients and the constant value obtained from multiple regression

analysis stepwise method, regression equation under investigation form was obtained:

$$Y = 18.237 + 0.434X_1 + 0.133X_2 + 0.329X_3 + 0.346X_4$$

Table 4: Importance of extension agents characteristics for supporting sustainable agriculture

Extension agents	Mean	SD*	CV**	Rank
Knowledge about:				
Information presentation	3.31	0.89	0.269	1
Adult education	3.20	0.90	0.280	2
Information technology	3.21	0.90	0.281	3
Sustainable agriculture	3.20	0.90	0.282	4
HRD	3.10	0.89	0.287	5
Participatory approaches	3.10	0.90	0.289	6
Facilitator	3.00	0.89	0.298	7
Farm management	3.00	0.91	0.303	8

Scale: 1=very low, 2=low, 3=moderate, 4=high, 5=very high

* Standard Deviation; ** Coefficient of Variation

Table 5. Results of multiple regression analysis step by step style

Independent variables	B	SE B	Beta	t	sig
Goals	0.434	0.123	0.262	2.334	0.020
Contents	0.133	0.197	0.237	2.321	0.027
Organization	0.329	0.143	0.243	2.643	0.010
Extension agents	0.346	0.293	0.302	1.09	0.031
Constant	18.237	4.636	----	2.317	0.001
R ² =0.481, Signif F=0.010 F= 4.635					

The results also showed that favorable goals, contents, organization and extension agents can explain 48% of variance of dimensions of sustainable agriculture (Table 5).

4. Recommendations

The results of this study were identified important extension system goals that are essential for supporting sustainable agriculture. Agricultural extension organizations in provincial and national levels can benefit from these proposed goals firstly in program development for farmers and secondly in professional development in the future. The most important goals of extension system for supporting sustainable agriculture were: increasing knowledge and skills of sustainability, increasing productivity and efficiency, health development, technology transfer and development of food security.

Also, the results of this study were identified important contents of extension system that are essential for supporting sustainable agriculture. Agricultural extension organizations in provincial and national levels can benefit from these proposed contents. The results that indicated the most important extension contents were: development of organic farming, development of biological control, food security contents, development of integrated management and considering crop yield.

In addition, the results would guide the extension policy makers in the province and country to be aware of the important extension organization characteristics which are necessary for supporting sustainable agriculture. The most important characteristics that have been recommended and agricultural extension organizations must consider were: interaction communication, systematic management, occupations quality, and horizontal communication.

Based on the results, the extension organizations of Khuzestan province are encouraged to consider most important characteristics of extension agents for program execution. The most important characteristics were: skills of information presentation, knowledge of adult education, knowledge of information technology, and knowledge about sustainable agriculture.

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