Favorable Content of Sustainable Agriculture Extension Programs In Khouzestan Province of Iran

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Abstract: The purpose of research was identify favorable content of sustainable agriculture extension programs in Khouzestan province of Iran. A sample of 79 respondents was selected through simple random sampling technique. A survey study was applied as a methodology of research work. Data were collected using a structured questionnaire that addressed to evaluate agricultural extension experts' responses regarding the necessity of attention on each extension system content to accomplish sustainable agriculture in Khouzestan province of Iran. For determining the validity of questionnaire, the face and content validity was used. Cronbach's alpha was used to measure reliability of the instrument, which was 0.80 and showed the instrument reliability. Descriptive findings revealed that "Food security", "Integrated management", "Biological control practices", "Quality of crops" and "Conservation practices" were the first contents for extension system toward sustainability, respectively. According to factor analysis, the contents of extension system for supporting of sustainable agriculture were categorized into three main components, which have been named *Natural conservation, Human health and Economic contents.* The obtained results from the factor analysis revealed that the three mentioned factors explained 75.231% of the variation of extension content for supporting of sustainable agriculture in agriculture.
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1. Introduction

In past decades, agricultural development policies have been remarkably successful at emphasizing external inputs as the means to increase food production. This has led to growth in global consumption of pesticides, inorganic fertilizer, animal feedstuffs, and tractors and other machinery (Ommani and Chizari, 2010). These external inputs have, however, 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; information for management decision comes from input suppliers, researchers and extensionists rather than from local sources and fossil fuels have substituted for locally generated energy sources (Roling and Pretty, 1997).

The basic challenge for sustainable agriculture is to make better use of these internal resources. This can be done by minimizing the external inputs used, by regenerating internal resource more effectively, or by combinations of both (Ommani and Chizari, 2007).

According to various studies, the agri-food sector in Iran has not yet shown significant development during the last decades. Despite the advancement of infrastructural services made available to rural people over the past 20 years, they still, live in unequal social and cultural environments. The most important challenges may fall in the following categories: Inadequate resource management for production and insisting degradation of soil or water resources and the associated ecological consequences and inadequate job opportunities (Safaei, 1999). Nevertheless, there is various evidence that agriculture is still far behind the real potential of the country considering its available resource. On the other hand, sustainable land and water use has not yet been reached in Iran (Darvishi, 2003). In Iran, like other developing countries, agriculture is one of the most important economic sectors and comprises a considerably high percentage of production and employment. Rural economic activities are related to three major sectors: agriculture, industry, and services (Ommani et al 2009).

Karshenas (1994) contended that the difficulties within Iranian agriculture have resulted from inefficient resources management by actors within the sector, rather than by a squeeze of natural resources in agriculture. Hence, more consideration to human resources in the agricultural sector is essential. Since farmers and land and water users are the primary active human resources in the agricultural sector, increasing their competence is of necessity to improve the efficiency and productivity of farming. Today more consideration to human resources in the agricultural sector becoming increasingly important because of the competitiveness within the sector. Based on the

research of Karami & Rezaei-Moghaddam (1998), both socio-economic characteristics and environmental conditions of the farm have increased the poverty of Iranian farmers. They suggest that smallholder farmers with under-developed socio-economic and environmental conditions are relatively poorer. They concluded that poverty is a major reason for unsustainable agriculture. Lack of sufficient farm management competencies effectuate higher soil erosion, over-fertilization, inadequate application of manure, lack of fallow, overgrazing, burning of crop residue, and over-use of pesticides.

In addition, Ommani and Chizari (2010) reported that:

"Major barriers hampering adoption of sustainable agriculture practices included: limited financial returns for farmers, limited farmer knowledge of sustainable agriculture principles and methods, low levels of farmer education, government rules and regulations, problems with soil erosion and lack of water, and a low level of extension agent knowledge with respect to sustainable agriculture."

Agricultural extension in Iran such as many developing countries is mainly focused on common extension approach**.** Studies showed that traditional extension system have not been sufficiently effective in promoting adoption of sustainable agriculture practices**.** Studies indicated that Iran's sustainable agricultural extension contents are not favorable and the extension system does not pay enough attention to them. These conditions necessitate rethinking of extension contents to accomplish sustainable agriculture (Ommani and Chizari, 2010., Allahyari, 2008).

The purpose of the present study was to identify the most appropriate contents for agricultural extension toward sustainability in Iran context.

2. Material and Methods

The research method was quantitative research. In quantitative research, the researcher identifies variables and may look for relationships among them, but does not manipulate the variables (Gay and Airasian, 2003). A major form of nonexperimental quantitative research that has been used in this research is correlation study. This method seeks to determine relationships among two or more variables (Creswell, 2008). The total population of agricultural extension experts (N=110) of Agricultural-Jihad Organization of Khouzestan Province, Iran considered as population of study. Based on Krejce and Morgan (1970), 79 of agricultural extension experts selected as sample size of research. A mailed questionnaire was used to collect the data. The model of questionnaire derived from studies of Arellanes and Lee (2003); Hersman (2004); Boone et al (2007), Karami and Rezaei-Moghadam (1998). To test the validity of a questionnaire, content-related evidence of validity by panel of experts was used. To test the content-related evidence, 20 copies were provided and distributed among faculty members of Islamic Azad University. Their suggestions were incorporate in the final version of the instrument. Researchers examined reliability evidence by 30 copies of questionnaire of experts that provided and distributed among agricultural extension experts from Esfahan Province. Reliability of overall instrument was estimated at 0.80. The instrument consisted of two separate sections according to the purpose and objectives of the study. The first section was designed to gather data on personal characteristics of extension experts. The second section was designed to gather data regarding the necessity of attention on each extension system contents to accomplish sustainable agriculture in Iran. Extension experts were asked to rate their viewpoints concerning this necessity on a five point Likert - type scale: 1 = very low, 2 = low, 3 = medium, 4 = much and 5 = very much.

The data were collected between October 2008 and March 2009. After gathering and encoding information from the questionnaires, data was obtained for analysis. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS, 16). Beside descriptive statistics, Factor Analysis and Kruskal -Wallis test were employed for detailed analysis. Figure 1 indicates, different items were considered in literature of research.

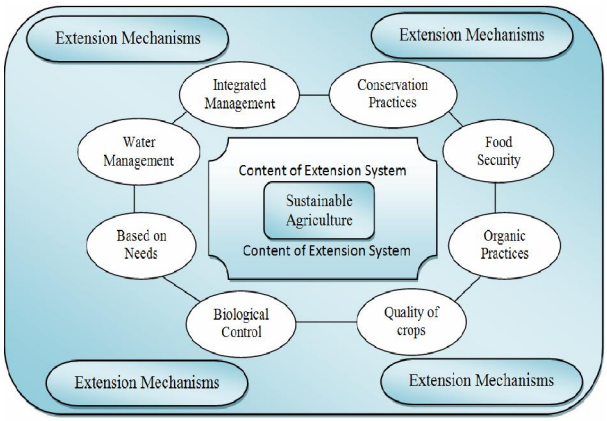

Figure 1: Theoretical Framework of Research

3. Results

The ages of the respondents ranged from 27-58. The mean age was 33 (SD = 7.45, n = 79). The majority (44.3%, n = 35) of respondent were 31-40 years old. The years of experience of respondents ranged from 1-28. The mean years served in extension were 10.8 (SD = 6.54).

In the present study the experts were questioned about the importance rate of extension contents for supporting sustainable agriculture by 5-point scale (1=very low, 2=low, 3=moderate, 4=high, 5=very high). As Table 1 indicates, the five most important extension contents according to the experts were: (1) Food security (M= 3.9, Sd= 1.09), (2) Integrated management (M=3.8, Sd= 1.09), (3) Biological control practices (M= 3.7, Sd=1.11), (4) Quality of crops (M=3.5, Sd= 1.21), and (5) Conservation practices (M= 3.1, Sd= 1.19).

In reference to the frequency of respondents about extension contents, 25.3% of respondents stated that the considering food security had very high importance for supporting sustainable agriculture.

To categorize content of extension systems toward sustainability, an exploratory factor analysis was conducted for the data presented in Table 2. The factor analysis used was a principal components analysis with factor extraction and VARIMAX rotation. The four commonly used decision rules were applied to identify the factors (Hair et al, 2005): 1) Minimum eigenvalue of 1; 2) minimum factor loading of 0.5 for each indicator item; 3) simplicity of factor structure; and 4) exclusion of single item factors.

Based on the results of Bartlett and KMO(Kaiser-Mayer-Olkin) tests was realized whether the data are appropriate for factor analysis (KMO=0.722; Bartlett=832.8, Sig= 0.000). It revealed that the internal coherence of the data is appropriate.

The contents of extension system for supporting of sustainable agriculture were categorized into three main components, which have been named *Natural conservation, Human health and Economic contents* (Table 2). The obtained results from the factor analysis revealed that the three mentioned factors explained 75.231% of the variation of extension content for supporting of sustainable agriculture in agriculture (Table 2, 3). The first group, which is labeled Natural conservation content, consists of four items and Cronbach's alpha for this group is 0.85, which is more than sufficient. This factor had the most Eigen value (3.73). Also, this factor explained 37.574% of the total variances of the variables. The second group, labeled Human health content, is comprised of three items. This component has a Cronbach's alpha of 0.752, which can be regarded as sufficient. In addition, this component that its Eigen value was 2.23 explained 25.371% of the total variances of the variables (Table 2). Based on results field frame work was showed in figure 2.

Table 1. Importance of extension system contents for supporting sustainable water resources management in agriculture

Content of Extension System	Very Low		Low		Average		High		Very High		M	SD	CV	R
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*				
Food security	0	0	3	3.8	21	26.9	35	44.3	20	25.3	3.9	1.09	0.281	1
Integrated management	0	0	5	6.3	26	32.9	28	35.4	20	25.3	3.8	1.09	0.287	2
Biological control practices	2	2.5	10	12.7	22	27.8	23	29.1	22	27.8	3.7	1.11	0.296	3
Quality of crops	7	8.9	11	13.9	21	26.6	15	19	25	31.6	3.5	1.21	0.345	4
Conservation practices	9	11.4	13	16.4	29	36.7	15	19	13	16.4	3.11.19		0.380	5
Water resources efficiency and productivity	7	8.9	15	19	24	30.3	21	26.6	12	15.9	3.2	1.26	0.393	6
Integrating indigenous and new knowledge	12	15.2	20	25.3	21	26.6	15	19	11	13.9	2.9	1.20	0.412	7
Considering crop yield	15	19	17	21.5	32	40.5	12	15.2	3	3.8	2.6	1.15	0.437	8
Mechanical and farming control	12	15.2	23	29.1	29	36.7	11	13.9	4	5.1	2.6	1.29	0.487	9

M=Mean, SD=Standard Deviation, CV= Coefficient of Variation, R=Rank

Table 2. Percent of explained variance by factors underling extension contents

Factors	**Percentage**	**Cumulative Percentage**
Natural conservation content	37.574	36.514
Human health content	25.371	62.918
Economic content	12.313	75.231

Table 3. Rotated component matrix for the extension contents for supporting of SWRM

Content of Extension	Factor Loadings for Components[a]		
	Natural conservation content	Human health content	Economic content
1. Conservation practices	0.781		
2. Integrated management	0.908		
3. Biological control practices	0.875		
4. Mechanical and farming control	0.834		
5. Quality of crops		0.706	
6. Water efficiency and productivity			0.706
7. Integrating indigenous and new knowledge		0.805	
8. Considering crop yield			0.685
9. Food security		0.756	

[a] factor loading< 0.5 were omitted

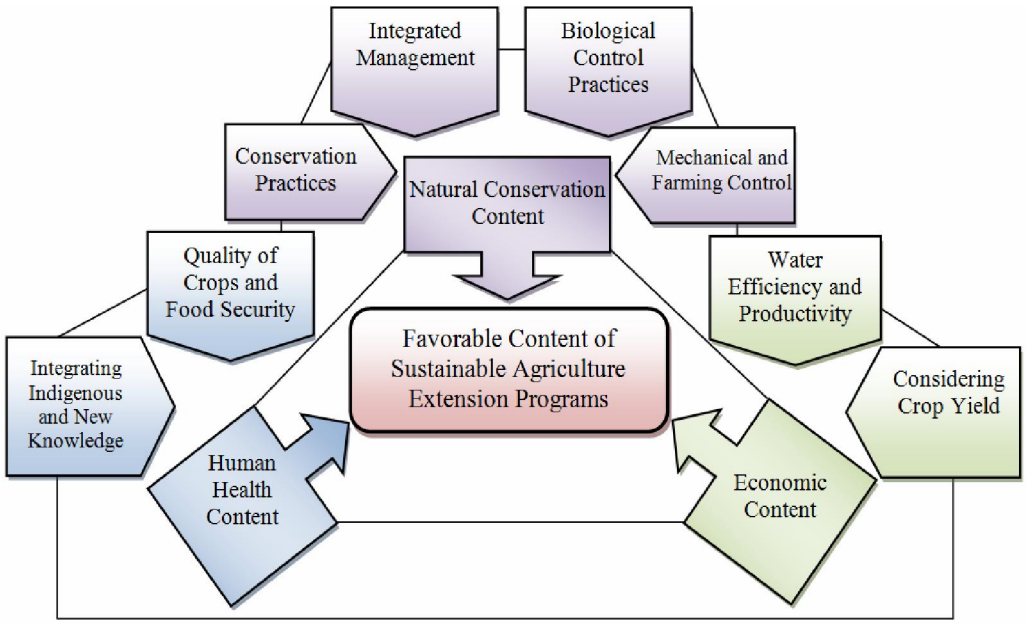

Figure 2: Field Framework of Research

4. Conclusion

For receiving favorability in content of sustainable agriculture extension programs in Khouzestan province of Iran, there is a need for reorientation in content of agricultural extension system. Iran's agriculture is facing serious environmental pollution and degradation problems and extension has a key role to improve it, but current extension system in Iran does not has a sufficient competency for the achievement of sustainability and it needs to shift toward new approaches with new objectives(Ommani and Chizari, 2010., Allahyari, 2008). According to the results of research, contents of extension system for supporting of sustainable agriculture were categorized into three main components, which have been named *Natural conservation, Human health and Economic contents*. Also, five most important extension contents for supporting of sustainable agriculture according to the experts were: (1) Food security, (2)Integrated management, (3)Biological control practices, (4)Quality of crops and (5)Conservation practices.

Because the natural environment strongly influences educational planning and operations, extension should respond to the technological needs of farmers in different agroecological zones. Contents of the agricultural extension should include a broad concept, such as farmers' communication among

each other, informal agricultural education, etc. Farmers strongly require new knowledge to improve their decision skill when they face a series of challenges in the market economy.

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