Favorable Characteristics of Professionals in Development of Sustainable Water Resources Management for Date Palm Growers in Khuzestan Province

Liza Nabhani*, Ahmad Reza Ommani** and Azadeh N. Noorivandi***
*M.Sc Graduated at Shoushtar Branch, Islamic Azad University, Shoushtar, IRAN.
**Associated Professor Shoushtar Branch, Islamic Azad University, Shoushtar, IRAN.
***Assistant Professor Shoushtar Branch, Islamic Azad University, Shoushtar, IRAN.

(Corresponding author: Ahmad Reza Ommani)

ABSTRACT: Agriculture by using more than 70 percent of all water resources is the predominant consumer of water that has played a major role in feeding people. The date palm is considered as one of the most important horticultural crops in Khuzestan province. Due to limited water resources quality and quantity, it is necessary to reform strategies and technologies to increase water use efficiency. To obtain this goal, agricultural extension systems as a training and notification mechanism can play a key role to timely notification and enhance managerial ability of Date growers. Nowadays, it is certain that agricultural extension will be effective, when it be operating within a system. The main elements of extension system are professionals of extension system, and their Characteristics play a key role for operating the extension system. The population of experts in this study are included all agricultural extension experts (N=150) of agricultural-Jihad Organization of Khuzestan Province. A survey study was applied as a methodology of research work. Data were collected using a structured questionnaire. 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 showed the instrument reliability. The purpose of this research was identifying favorable professionals characteristics of water resources management extension system for date palm growers in Khuzestan province of Iran. Based on the results, current professionals characteristics of extension system regarding all items of water resources management for date palm growers in Khuzestan province is not favorable. Wilcoxon signed ranks were used for analyzing causal comparative of water resources management, between current and favorable conditions which showed that there were significant differences between current and favorable conditions(P 0.01).

The results of this study indicated favorable professionals characteristics are respectively: Professionals with the ability to use participatory methods, multidisciplinary professionals, or in conjunction with other disciplines, professionals with the ability to use new communication skills, and professionals with specialized knowledge and technical competence about water resources management technologies.

According to factor analysis, the professionals characteristics of extension system for supporting of water resources management were categorized into two main components, which have been named Participation Oriented, and Specialized and Facilitators. The obtained results from the factor analysis revealed that the two mentioned factors explained 74.857% of the variation of extension Professionals Characteristics for supporting of water resources management extension system.

Keywords: Favorable Characteristics of Professionals, Agricultural extension system, Water Resources Management, Date palm growers

INTRODUCTION

Agriculture is the main source of national income for most developing countries. However, for the developed countries, agriculture contributes a smaller percent age to their national income (Anonymous, 2014). 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 (Karbasioun, 2007). The whole land under date cultivation in Iran is estimated about 240000 ha (FAO, 2010) of which over 43000 ha are allotted to Khuzestan province (Statistical letter, 2010). Rural economic activities are related to three major sectors: agriculture, industry, and services (Ommani *et al*, 2009).

Agricultural extension is the conscious provision of information and communication support to rural users of renewable natural resources. It involves offering advice, helping farmer's analyses problems and identifies opportunities, sharing information, supporting group formation and facilitating collective action (Garforth and Lawrence, 1997). In recent years, Khuzestan province encountered shortage of water resources. Water resources management in agriculture and increasing the water use efficiency in Khuzestan province has a vital role for conservation of water resources (Organization of Agricultural-Jihad of Khuzestan, 2004). Date palm tree is considered as one of the most important fruit crop in its high nutrition values and it is the most important horticultural crops in Khuzestan province that has strategic value in the region and in the country's food security and exports. The reduction in rainfall in recent years and reducing agricultural water resources in this region has caused problems for date palm growers (Pejman *et al,* 2002). Agricultural extension is a public service for human resource development (HRD) in the agricultural sector (Van den Ban & 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).

Extension could play a key role in fostering sustainability through its educational programs but there has been a growing realization that traditional extension models have not been sufficiently effective in promoting adoption of sustainable agricultural practices (Allahyari, 2009).

Extension is done not only by extension agencies but also by farmers, scientists, commercial companies and mass media organizations. Traditionally extension has been linked with production objectives. More recently, food security, improved nutrition, equity and poverty alleviation have become part of the agenda of organizations providing extension services (Garforth and Lawrence, 1997).

Nowadays, it is certain that agricultural extension will be effective, when it be operating within a system. The main elements of extension system are goals, target groups, methods, organizations, professionals and the contents (Mirzayee *et al,* 2007). Based on (Marcho & Boland, 2003) researches findings, the following training topics are recommended to emphasize in the pre-service training programs. These are training in agricultural extension philosophy, organization and administration, planning extension strategies to meet farmers' needs, educational process and human resource development, research methods and evaluation in extension, the use of information and communication in extension and sociological factors. Many of these social science skills are lacking in the agricultural graduates working as extension agents in the agricultural extension division (Marcho & Boland, 2003). Direction refers to the main flows of planning and technical information between extension agency and clients. The sustainability agenda calls for local participatory planning, and a willingness by extension agencies to learn from farmers' experiences, knowledge and technology (Garforth and Lawrence, 1997). Kroma (2003), in his article: Participation and Social Learning, introduce the social learning as a new role relationships and claimed that This social organization of innovation reflects a unique flexibility and character quite different than conventional ways by which extension agents and researchers work with local people. The social learning process clearly expands the role of extension beyond the conventional "extensionist as communicator", to professions as facilitator, organizer, coordinator and network builder for intra and inter-group learning. According to Campbell (1994) such shifts in the role of extension entail the fostering of group synergies among farmers, while linking them to sources of information and knowledge within and outside their communities. Professionals in extensional activities have a key role in achieving the ultimate goal. These people should have the conviction to their job and have the ability and necessary expertise to carry out extensional activities in rural areas. Some of the abilities that they considered for the professionals Quoted from Seevers et al are: Interpersonal and communication skills, commitment to their job, designing and implementing programs, problem solving, self-confidence and positive attitude (Noorivandi and Ommani, 2009). The findings of Allahyari (2008) study indicated that the attitude of Iranian agricultural extension professionals (faculty members of universities, experts of agricultural extension & farming system & agricultural managers in provinces) is not in a favorable situation. On the other hand, despite difference in type of activities and educational level, no significant difference could be seen between the attitudes of the three groups and the findings of this research agree those of Karami and Hayati (1998). The first step in sustainability and resources management plans is to need educated agents in sustainable agriculture that could develop their understanding, qualification and ability to teach and communicate development concepts (Al-Subaiee *et al.,* 2005); nonetheless, researches show that the agricultural extension professionals and experts have problems in the very first step; that is understanding the concept of sustainability (Chizari *et al.,* 2006). This indicates the necessity of undertaking a research work in this issue.

By shifting in philosophical foundations of rural and agricultural development's thoughts, and emerging new professionalism with new concepts, values, methods and behavior, extension agents should be adapted themselves with these changes. In this regard, Moyo and Hagmann (2000) believe that the role of the extension agent is to facilitate learning process. This involves the facilitation of:

(a) A process of community development and innovation; (b) A process of collective and individual farmer learning about innovation (technical and social) to enhance the community's capacity to innovate and;(c) Rural knowledge management.

The new role of managing and facilitating learning processes implies special skills and competencies that are far from the present technical focus of extension agents and thus to be developed (Allahyari, 2009). 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 characteristics of professionals in agricultural extension system for Khuzestan province have important role to developing extension system. The purpose of the present study was to identify the most appropriate and comparative analysis of current and favorable extension system professionals of water resources management for Date palm growers in Khuzestan province.

METRIALS AND METHODS

This study carried out in the cities of Khuzestan province that date palm is cultivated such as Ahvaz, Behbahan, Shadegan, Abadan, Khoramshahr during 2013 to 2014.The research method was quantitative, correlative descriptive and causal relation 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).

The total population of agricultural extension experts (N=150) of Agricultural-Jihad of Khuzestan Province, Iran, considered as population of study and were selected for participation in the study. One hundred and thirty agricultural extension experts returned questionnaires yielding an overall response rate of 86.7%. A questionnaire was developed to gather information regarding water resources management for Date Palm growers in Khuzestan province. Questions were generated from the literature review. The survey was divided into two sections to gather data on personal characteristics of extension experts and the degree of current and favorable regarding water resources management. Responses for 2nd section were

categorized using a Likert-type scale from point 1 to 5 representing very low important to very high important respectively. Content and face validity were established by a panel of experts from faculty members. Questionnaire reliability was estimated by calculating Cronbach's alpha. Reliability was Cronbach's alpha=0.89, which can be regarded as sufficient. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS, 17). Appropriate descriptive statistics such as mean scores and standard deviations were used to analysis the data generated. Inferential statistics such as Wilcoxon signed ranks were used to analysis data. The factor analysis used to identify the factors and to categorize Professionals Characteristics of extension systems toward supporting water resources management.

RESULTS AND DISCUSSION

In first section agricultural extension experts' demographic profile in Khuzestan province of Iran were described. The ages of the respondents ranged from 23-68. The mean age was 38 (SD = 8.50, n = 130). The majority (37.7%, n = 49) of respondent were 34-44 years old. In reference to the frequency of respondents' gender, 55.4% of experts were male and 44.6 % were female. The years of respondents' experience ranged from 1-30. The mean years served in extension were 12.7 (SD = 8.40) and about 69% of experts had a Master of Science degree level of education.

In the present study the experts were questioned about the importance rate of Professionals Characteristics for supporting water resources management for Date palm growers in Khuzestan province in current and favorable conditions, by 5- point scale (1 = very low, 2 = low, 3 = moderate, 4 = high, 5 = very high). As Table 1 indicates, the four most important Professionals Characteristics according to the experts in current conditions, were: (1) Considering the extensionists as a facilitator (M = 2.90, Sd = 0.90), (2) professionals with the ability to use new communication skills (M = 2.66, Sd = 0.88), (3) multidisciplinary professionals, or in conjunction with other disciplines (M= 2.66, Sd = 0.89), (4) professionals with specialized knowledge and technical competence about water resources management technologies (M = 2.73, Sd = 0.94), while in reference to the frequency of respondents about Professionals Characteristics of extension system, in current conditions 79% of respondents stated that the considering Professionals Characteristics had low and average importance for supporting water resources management (Table 2).

Table 1: Present importance of professionals Characteristics of extension system for supporting water resources management for Date Palm Growers in Khuzestan Province.

professionals Characteristics	Very Low		Low		Average		High		Very High		M	SD	CV	R
	f	%	f	%	f	%	f	%	f	%				
Considering the extensionists as a facilitator	7	5.4	34	26.2	57	43.8	28	21.5	4	3.1	2.90	0.90	0.310	1
professionals with the ability to use new communication skills	9	6.9	51	39.2	47	36.2	21	16.2	2	1.5	2.66	0.88	0.332	2
multidisciplinary professionals, or in conjunction with other disciplines	12	9.2	41	31.5	60	46.2	13	10.0	4	3.1	2.66	0.89	0.335	3
professionals with specialized knowledge and technical competence about water resources management technologies	13	10.0	35	26.9	60	46.2	17	13.1	5	3.8	2.73	0.94	0.344	4
professionals with the ability to use participatory methods	15	11.5	44	33.8	52	40.0	18	13.8	1	0.8	2.58	0.89	0.346	5
professionals with the ability to form and mobilize local communities	14	10.8	41	31.5	53	40.8	20	15.4	2	1.5	2.65	0.92	0.347	6
professionals with skills on dialogue, negotiation and conflict resolution	13	10.0	51	39.2	44	33.8	18	13.8	4	3.1	2.60	0.95	0.365	7

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

Table 2: Current importance of professionals Characteristics in extension system.

Importance	Frequency	Percentage	Cumulative Percentage
Very Low	16	12.3	12.3
Low	61	46.9	59.2
Average	42	32.3	91.5
High	10	7.7	99.2
Very High	1	0.8	100
Total	**130**	**100**	

Table 3: Favorable importance of professionals Characteristics of extension system for supporting water resources management for Date Palm Growers in Khuzestan Province.

Professionals Characteristics	Very Low		Low		Average		High		Very High		M	SD	CV	R
	f	%	f	%	f	%	f	%	f	%				
Professionals with the ability to use participatory methods	-	-	1	0.8	27	20.8	69	53.1	33	25.4	4.03	0.70	0.174	1
multidisciplinary professionals, or in conjunction with other disciplines	-	-	3	2.3	24	18.5	74	56.9	29	22.3	3.99	0.70	0.177	2
Professionals with the ability to use new communication skills	-	-	-	-	30	23.1	48	36.9	52	40.0	4.16	0.77	0.186	3
Professionals with specialized knowledge and technical competence about water resources management technologies	2	1.5	2	1.5	14	10.8	73	56.2	39	30.0	4.11	0.77	0.188	4
Professionals with the ability to form and mobilize local communities	-	-	2	1.5	28	21.5	59	45.4	41	31.5	4.06	0.76	0.189	5
Considering the extensionists as a facilitator	-	-	5	3.8	18	13.8	55	42.3	52	40.0	4.18	0.81	0.194	6
Professionals with skills on dialogue, negotiation and conflict resolution	-	-	6	4.6	26	20.0	43	33.1	55	42.3	4.13	0.89	0.216	7

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

Table 4: Causal comparative between current and favorable Professionals Characteristics in extension system of water resources management for date palm growers in Khuzestan province by Wilcoxon signed ranks.

Item	Z	Sig
Multidisciplinary professionals, or in conjunction with other disciplines	8.950	0.000**
Professionals with specialized knowledge and technical competence about water resources management technologies	8.944	0.000**
Considering the extensionists as a facilitator	8.032	0.000**
Professionals with the ability to use participatory methods	8.892	0.000**
Professionals with the ability to use new communication skills	9.236	0.000**
Professionals with skills on dialogue, negotiation and conflict resolution	9.093	0.000**
Professionals with the ability to form and mobilize local communities	8.547	0.000**

**P 0.01

Table 3 indicates, the four most important Professionals Characteristics according to the experts in favorable conditions, were: (1) professionals with the ability to use participatory methods (M = 4.03, Sd = 0.70), (2) multidisciplinary professionals, or in conjunction with other disciplines (M = 3.99, Sd = 0.70), (3) professionals with the ability to use new communication skills (M = 4.16, Sd = 0.77), (4) professionals with specialized knowledge and technical competence about water resources management technologies (M = 4.11, Sd = 0.77).

In inferential analysis, Wilcoxon signed ranks were used for analyzing causal comparative of water resources management, between current and favorable Professionals Characteristics. Based on the results in each (Table 4) and overall (Table 5) items (Z = 9.485, P=0.000), there were significant differences between current and favorable Professionals Characteristics. Multiple researchers such as Allahyari (2009), Ommani (2011), Khabazzade (2011) also have found similar results.

To categorize professionals' characteristics of extension system toward supporting water resources management, an exploratory factor analysis was conducted for the data presented in Table 6. 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.

Table 5: Causal comparative between overall items of extension system Professionals Characteristics of water resources management for date palm growers in Khuzestan province by Wilcoxon signed ranks.

Item	Z	Sig
Overall items of extension system Professionals Characteristics	9.485	0.000**

**P 0.01.

Table 6: Percent of explained variance by factors underling Professionals Characteristics in extension system.

Factors	Percentage	Cumulative Percentage
Participation Oriented	62.536	62.536
Specialized and Facilitators	12.321	74.857

Based on the results of Bartlett and KMO (Kaiser-Mayer-Olkin) tests was realized whether the data are appropriate for factor analysis (KMO = 0.864; Bartlett = 550.261, Sig = 0.000). It revealed that the internal coherence of the data is appropriate.

The Professionals Characteristics in extension system for supporting of water resources management for date palm growers were categorized into two main components, which have been named Participation Oriented, and Specialized and Facilitators (Table 6). The obtained results from the factor analysis revealed that the two mentioned factors explained 74.857% of the variation of extension Professionals Characteristics for supporting of water resource management (Table 6, 7). The first group, which is labeled Participation Oriented, consists of four items and Cronbach's alpha for this group is 0.841, which is more than sufficient. This factor had the most Eigen value (4.377). Also, this factor explained 62.536% of the total variances of the variables. The second group, labeled Specialized and Facilitators, is comprised of three items. This component has a Cronbach's alpha of 0.715, which can be regarded as sufficient. In addition, this component that its Eigen value was 3.228 explained 12.321% of the total variances of the (Table 6, 7).

Table 7. Rotated component matrix for professionals characteristics for supporting of water resource management in extension system for date palm growers in Khuzestan province of Iran.

professionals characteristics	Factor Loadings for Components	
	Participation Oriented	Specialized and Facilitators
Professionals with the ability to form and mobilize local communities	0.849	
Professionals with skills on dialogue, negotiation and conflict resolution	0.842	
Professionals with the ability to use new communication skills	0.839	
Professionals with the ability to use participatory methods	0.837	
Professionals with specialized knowledge and technical competence about water resources management technologies		0.772
Considering the extensionists as a facilitator		0.717
Multidisciplinary professionals, or in conjunction with other disciplines		0.657

CONCLUSIONS

For receiving favorability in water resources management, extension programs in Khuzestan province of Iran, there is a need for reorientation in professionals characteristics of agricultural extension system and extensionists has a key role to improve it, but current extension system in Iran does not has a sufficient competency for the achievement of water resource management and it needs to shift toward new approaches with new objectives (Ommani and Chizari, 2010, Allahyari, 2008). According to the results of research, professionals characteristics of extension system for supporting of water resources management for date palm growers were categorized into two main characteristics, which have been named Participation Oriented and Specialized and Facilitators as the professionals characteristics.

Also, four most important professionals characteristics for supporting of water resource management in favorable conditions according to the experts were: (1) professionals with the ability to use participatory methods, (2) multidisciplinary professionals, or in conjunction with other disciplines, (3) professionals with the ability to use new communication skills, (4) professionals with specialized knowledge and technical competence about water resources management technologies.

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