

Developing Indicators for Farmers' Satisfaction with Extension Services in Iran Utilizing Delphi Technique

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ABSTRACT

The lack of accountability of government organizations to address the needs of stakeholders and the private sector and the provision of low-quality services to clients has increased dissatisfaction with government services. Therefore, providing quality services is essential to increase satisfaction with government organizations. Extension services are one of the main components of sustainable agriculture development in Iran and are provided to farmers through the Agricultural Research, Education, and Extension Organization (AREEO). Considering the low level of farmers' satisfaction with extension services, development of a system for assessing farmers' satisfaction as a strategic project has been emphasized. This study was conducted to develop the components of farmers' satisfaction with extension services and determine the factors affecting their satisfaction, in 2019. In this study, the classic Delphi method was used during three rounds. The expert panel consisted of nine university faculty members, 14 faculty members of AREEO, and 19 headquarters extension experts (n= 42). Delphi results led to the selection of 37 components to assess the satisfaction of farmers with the extension services. These components were classified using the constant comparative method in four main factors. These factors include technical and professional features of the extension experts, service quality, perceived effectiveness, and policy, management, and planning.

Keywords: Classic Delphi method, Constant comparative method, Perceived effectiveness, Stakeholders' satisfaction.

INTRODUCTION

According to Hill (2014), the environment surrounding government organization, in addition to increasing complexity and uncertainty, witness interaction with the rapidly evolving world, which makes further changes in a sector, causing unpredictable, unbalanced, and dangerous effects all over the environment and organization. The fact is that the quality of service provided by public organizations is challenging (Sharmin, 2012).

Agricultural sector is the main source of income for the majority of the rural Iranian population. It contributes 12 percent of the total GDP, 22 percent of employment, 15

percent of non-oil exports, and 90 percent of the country's food and agricultural raw materials (Abbasi *et al.*, 2015). Increasing demand for agricultural products, along with ever-limiting production resources, have made it necessary to adopt the strategy of increasing productivity, mainly production per unit area. This goal could be mainly achieved by enhancing farmers' professional knowledge and transfer of new agricultural technologies through extension services (Aydogdu, 2017). Nowadays, agricultural extension is considered as the most appropriate approach for environmental education, rural and agricultural entrepreneurship (Azizi-Khalkheili, 2017), productivity, food security and rural

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livelihoods (IFRI, 2015), especially in developing countries. Farmers' acceptance is more dependent on satisfaction with the provided services after the use of extension services Abdolmaleki *et al.*, 2007; Hu, 2012). However, farmers' tendency to use these services is low in Iran (Haji-Mirrahimi, 2016). Accordingly, the low tendency of farmers to use extension services has been identified as one of the reasons for the failure of the Iranian extension system (Akbari *et al.*, 2014). In other words, the extension system of Iran is not ready to meet the needs of the farmers and, as a result, the satisfaction of this system is low (Haji-Mirrahimi, 2016).

Although the public agricultural extension system in Iran, has a history of more than 50 years, it has not been able to meet farmer's needs (Hashemi and Hejazi, 2011). From a management point of view, this system has a wide structure, which includes the extension and education department in the headquarters office, nineteen national research institutes, thirty-four provincial agricultural research and education centers, and thirty-two agricultural extension offices. The vision of Agricultural Research, Education, and Extension Organization (AREEO) is "Program-oriented, Agility, and The vision statement of Agricultural Research, Education, and Extension Organization (AREEO) is: "A program-oriented, agile and effective organization that has a research system and knowledge and information management based on the needs of stakeholders. According to the vision statement, one of the future orientations of the AREEO is to focus on farmers, in line with the AREEO's activities in the field of knowledge management based on the needs of farmers.

While researchers recognize that Customer Satisfaction (CS) plays a key role in a successful company strategy, few past researches have investigated farmers' satisfaction with the Agricultural Extension Plan (AEP). AEP in Iran provides a range of educational services for rural people and attempts to reach a very wide and

heterogeneous group of farmers (Yazdanpanah and Rahimi Feyzabad, 2017). The study of Shahabi *et al.* (2013) in Isfahan found that the farmers were satisfied with the impact of extension training on enhancing technical information and improving farm management. Moradi and Poorsaeid's study in Kermanshah Province (2014) showed that variables such as age, income, farm size, and use of extension services were positively and significantly correlated with satisfaction with extensional services. These findings are in line with the results of the Heidari Sarban's study (2013) in Ardabil Province, which states that access to extension services is one of the most important factors in increasing farmers' satisfaction with extension services. Besides the findings of Gorji *et al.* (2012) in Ahwaz found that the extension services did not have a great impact on empowering farmers to increase their efficiency and, therefore, farmers expressed dissatisfaction with these services. These results are similar to the findings of Haji-Mirrahimi's (2016) study in Qom Province, which showed that farmers were not well satisfied with extension courses.

Elias *et al.* (2015) research on satisfaction with agricultural extension services showed that 55% of the farmers were satisfied with the services, while 45% of the respondents were dissatisfied. The relationship between the level of education and level of satisfaction with the extension services showed that increasing the level of education leads to the wise use of extension services and increased satisfaction (Aphunu and Otoikhian, 2008). According to Zerfu and Larson (2010), household size, number of livestock, and crop size may help reduce the pressure of labor shortages, shortages of credit resources, and premium payments to effectively implement advisory recommendations, so, they can be considered as factors affecting farmers' satisfaction with extension services. Daniel Ayalew and Deininger (2012) research on the factors affecting farmers' satisfaction with extension services showed that, in

addition to personal and farm characteristics, the economic benefits of services are the main determinant of farmers' satisfaction. Researchers have shown a significant and positive correlation between farmers' relationship with service providers' extension and improving farmers' satisfaction (Cohen and Lemma, 2011). Ganpat *et al.* (2014) examined the satisfaction of farmers with the East Caribbean extension services. The results of this study showed that age, sex, level of literacy, farm size, number of farm parts, and number of visitations significantly affect the level of satisfaction of farmers. According to Jones *et al.* (2007 and 2010), communication is another important indicator in measuring farmers' satisfaction with extension services. Besides, application of communication channels has an affirmative relationship with farmers' tendency towards extension service (Faramarzi and Langerodi, 2013).

Investigating resources in addition to independent studies on the indicators of customer satisfaction shows the customer satisfaction index of different countries. The most largely used indicators are the European and American customer satisfaction index. American Customer Satisfaction Index (ACSI) provides specific categories of indicators of customer satisfaction measurement. In the structural part of the American model, five hidden variables include perceived quality, perceived value, customer expectations, customer complaints, and loyalty (YazdanPanah and Rahimi Feyzabad, 2017). Another model for customer satisfaction measurement is the European Customer Satisfaction Index (ECSI). ECSI is a tool created for assessing customer satisfaction and loyalty (Ball *et al.*, 2004). The four main indicators in the ECSI model are customer expectation, perceived quality, perceived value, and corporate image (Suh and Houston, 2010).

The basic purpose of this study was to identify the components of satisfaction with extension services and to classify these

components and determine the factors of satisfaction from extension services.

MATERIALS AND METHODS

This study was conducted at the beginning of 2019, using a modified three-round classic Delphi technique, which identifies the components and factors of farmers' satisfaction from the extension services provided by the AREEO. Helmer (1966) described the Delphi technique as a method of refining group opinions through consensus on a particular topic. The Delphi technique is an appropriate method used in program planning, need assessment and developing indicators (Hasson and Keeney, 2011). Delphi technique classically initiates an unknown survey using questionnaires with controlled feedback to allow repetition within a panel of experts (Eastwood, 2011). The technique is appropriate for expanding indicators (Hasson and Keeney, 2011).

The researchers used a series of three-step questionnaires. Questionnaires were sent to experts by email and the completed questionnaires were received by email. The first round asked an open-ended question: What are the components and indicators of satisfaction with extension services in Iran? In the second round, panel members were asked to evaluate characteristics identified in the first round using a five-point Likert-type scale (1= Very Low, 2= Low, 3= Somewhat, 4= Much, 5= Very Much). Investigations showed that consensus was met for each statement if the mean score was greater than 3.5 and the standard deviation was equal to or less than one, which indicated a strong consensus for inclusion (Smalley and Retallick, 2011). In the third round, panel members were given individual results from the second round and demanded to show if they agreed or disagreed with each of the statements. According to Conner and Roberts (2013), it was determined a priori that characteristics with 80% agreement would be retained. Scientific texts show that consensus in this method can be achieved in

**Table 1.** Demographic characteristics of the Delphi panel (n= 42).

Characteristic	N	%	Characteristic	N	%		
Gender	Male	31	73.8	Province	Tehran	20	47.6
	Female	11	26.2		Zanjan	2	4.8
Education	MSc	20	47.6		Kurdestan	3	7.1
	PhD	22	52.4		Alborz	6	14.3
Experience	< 10	10	23.8		Gilan	2	4.8
	11-20	11	26.2		Kerman	2	4.8
	21<	21	50.0		Others	7	16.6

three rounds and, most commonly, three rounds affirmed sufficient to attain stability in the responses (Caldwell, 2005).

Panel Selection and Composition

Experts' panel choice is a main component in the Delphi method, as the credibility of the results relies on their adjudication (Donohoe, 2011). The most important features necessary for choosing panel members are knowledge and experience in the study, ability and willingness to participate, having enough time to participate, and executable communication skills (Radestad *et al.*, 2013). The study showed that the appropriate size for heterogeneous groups is between 20 and 60 participants (Musa *et al.*, 2015). According to these criteria, 51 experts were first identified. Of these, nine experts withdrew due to lack of time attending the panel. Therefore, 42 experts were asked to participate. The purposively sampled experts had at least eight years of work experience in extension management, and technology transfer, and a relevant Master's Degree. The expert panel consisted of nine faculty members of university, 14 faculty members of AREEO, and 19 headquarters extension experts (n= 42). Of the 42 experts, 31 were male (73.8%) and 11 were female (26.2%) (Table 1). Half of the panel experts had more than 20 years of work experience. Most panel members were in the Province of Tehran (20/42, 47.6%) and the Alborz Province (6/42, 14.3%). In terms of educational level, most panelists had PhD.

(22/42, 52.4%) and the other experts had a Master's Degree (20/42, 47.6%).

Data Analysis

Data were analyzed using descriptive statistics. Data collected using Likert type scales were treated as interval data and reported as means and standard. Nominal data were reported using frequencies and percentages.

RESULTS

The first objective of this research was to identify the components of satisfaction with extension services. The first round used an open-ended questionnaire, resulting in a receipt rate of 100%. Seventy-seven characteristics were identified from the 42 respondents (Table 2).

In the second stage, panel members were requested to evaluate each of the 77 characteristics identified in the first round applying a five-point Likert scale. All 42 panel members responded in round two (a response rate of 100%). Components with an average of 3.5 or more and standard deviations less than one were maintained for the third-round questionnaire. The Results of round two are displayed in Table 3.

Based upon the responses in the second round, panel members were requested whether they agreed or disagreed with each of the determined characteristics. All 42 panel members responded in this round (a 100% response rate). Components that

Table 2. Round one: Satisfaction components of extension services (n= 42).

Rank	Components	Responses
1	Paying attention to the real needs and expectations of farmers in providing extension services	26
2	Applicability and practicality of the provided services	18
3	Knowledge and technical skills are up-to-date and professional competence of experts	15
4	Participation of farmers in the planning, implementation, and evaluation of extension services	14
5	Easy availability for farmers to extension services, information and communication resources and experts	13
6	Effective and useful services provided to improve productivity and agricultural production efficiency	12
7	Effective and useful services offered for promoting the knowledge and technical skills of farmers	12
8	Effective and useful services offered for reducing production costs	11
9	The tangibility of the results and effects of the use of extension services in increasing the value added of production	11
10	Effective and useful services offered for increasing farmers' incomes	10
11	Extensive coverage of extension services for all farm groups fairly	10
12	The active presence of researchers and extension experts in the farmers' lands	10
13	Using various appropriate and participatory methods and channels to determine farmers' needs and provide extension services to farmers.	9
14	Quantitative and qualitative suitability of educational and support facilities for the provision of extension services	9
15	Friendly, polite and respected greeting approach of extension experts with farmers	8
16	Effective and useful services provided to solve problems of farmers	8
17	The effect of extension services on improvement of motivation, interests and positive attitudes toward agricultural jobs and change of farmers' professional behavior	8
18	Effective and appropriate interaction between extension experts and researchers with farmers	8
19	Suitable utilization of information and communication technology in extension activities	8
20	The appropriate informing with extension Services Program through mass media, web sites, and posters	8
21	Having a consistency system and guaranteeing extension services to farmers	8
22	Effective management and planning of services provided to farmers	8
23	Pay attention to the appropriate time according to the production calendar for the provision of extension services	8
24	The ability of experts to provide fast and timely service to farmers	7
25	Transfer of new agricultural production methods and technologies	7
26	Fulfill commitments and build trust	7
27	Use common language and understand farmers	6
28	The up-to-date information and knowledge and technical skills of extension experts	5
29	Provide correct and complete services to farmers	5
30	Adaptability of extension services with local agricultural production facilities	5
31	The fitting of extension services with local and available agricultural inputs and resources	5
32	Physical and mental support from farmers for the use of extension services	5
33	Responding to the farmers' complaints by the extension system	5
34	Extension services attention to environmental preservation and sustainability of production resources	4
35	A tendency to reuse extension services	4
36	The number of farmers' referrals to the extension experts	4
37	The amount of practical use of extension services	4
38	Multiplicity and variety of extension services	4
39	The flexibility of the extension system for the provision of extension services	4
40	Respect for indigenous knowledge and farmers' experience	4
41	Visiting extension experts and researchers from successful farmers' land	4
42	Observe the cultural and social issues of the local community in providing services	4
43	Ability to answer extension experts to farmers	3
44	The number of farmers access to equipment and technology needed	3
45	Having the extension system of adequate funding and budget	3
46	Transparency of rules for the provision of extension services to farmers	3
47	Allocating rewards to experts and researchers in order to motivate better work	3
48	Designing an appropriate work plan for extension experts and researchers	3
49	Adapting extension services and programs to farmers' economic status	3
50	Participation of farmers in implementing research projects	3

Continued...

**Continued of Table 2.** Round one: Satisfaction components of extension services (n= 42).

Rank	Components	Responses
51	The responsibility of Extension staff	2
52	A concentration of programs and Extension activities on the farmer	2
53	The effectiveness of extension services in improving agricultural production quality	2
54	The effectiveness of extension services in Increase yield of agricultural products	2
55	The fit of extension services with new innovations and changes	2
56	Encouraging other farmers to use extension services	2
57	The existence of suitable interaction and collaboration between extension experts and researchers	2
58	Continuous assessment of the effectiveness of extension services	2
59	Provide timely information to attract farmers' trust	2
60	Provide individual and customized services to farmers	2
61	Give accurate information to researchers to know the exact problem of each area	2
62	Localization of research findings, new knowledge, and technology	2
63	Selection of the best farmer and national celebrations	2
64	Helping the comfort and convenience of farmers	2
65	Provide continuous services to farmers	2
66	Time and locative flexibility of extension services	2
67	Assist in the marketing of agricultural products	1
68	Utilize the capacity of popular organizations in providing extension services	1
69	Farmers' awareness of the roles and responsibilities of the extension experts	1
70	Having a sense of accomplishment after using extension services	1
71	The financial health of the AREEO	1
72	Reliable and credible AREEO	1
73	The pride of history and past AREEO	1
74	Providing valuable services to the agricultural community	1
75	Innovative and progressive AREEO in providing services	1
76	Having a competitive product with a foreign product	1
77	Having adequate human and physical resources	1

Table 3. Round Two: Level of agreement with satisfaction components of extension services (n= 42).

Rank	Components	M	SD
1	The professional competence of extension experts	4.66	0.745
2	The responsibility of extension staff	4.32	0.739
3	The ability of extension experts to solve farmers' problems	4.55	0.828
4	Friendly, polite and respected greeting approach of extension experts with farmers	4.58	0.599
5	The up-to-date information and knowledge and technical skills of extension experts	4.61	0.718
6	The continued presence of extension experts in farmlands	4.29	0.927
7	Use common language and understand farmers	4.39	0.638
8	Effective and appropriate interaction between experts and farmers	4.29	0.768
9	The ability of experts to provide fast and timely service to farmers	4.18	0.865
10	Provide correct and complete services to farmers	4.50	0.797
11	Having a consistency system and guaranteeing extension services to farmers	4.03	0.976
12	Adapting extension services with farmers' knowledge, experiences, and Indigenous knowledge	3.92	0.969
13	Continuous assessment of the effectiveness of extension services	3.82	0.978
14	Fulfill commitments and build trust	4.45	0.860
15	Provide timely information to attract farmers' trust	4.34	0.815
16	Applicability and practicality of the provided services	4.47	0.797
17	Adaptability of extension services with local agricultural production facilities	4.38	0.982
18	The fitting of extension services with local and available agricultural inputs and resources	4.16	0.945
19	The fit of extension services with new innovations and changes	3.87	0.906
20	Extensive coverage of extension services for all farm groups fairly	3.84	0.956
21	Providing modern services and methods and technologies for agricultural production	3.66	0.708
22	Pay attention to the appropriate time according to the production calendar for the provision of extension services	4.08	0.945
23	Observe the cultural and social issues of the local community in providing services	3.97	0.885
24	Provide continuous services to farmers	3.87	0.875
25	Time and locative flexibility of extension services	3.68	0.989

Continued...

Continued of Table 3. Round Two: Level of agreement with satisfaction components of extension services (n= 42).

Rank	Components	M	SD
26	Easy availability for farmers to extension services, information and communication resources, and experts	4.35	0.824
27	The use of modern communication technologies for the rapid and timely transmission of information	3.71	0.867
28	Using various appropriate and participatory methods and channels to determine farmers' needs and provide extension services to farmers.	3.89	0.915
29	The suitable utilization of information and communication technology in extension activities	3.89	0.798
30	Effective and appropriate interaction between extension experts and researchers with farmers	3.79	0.987
31	Farmers' awareness of the roles and responsibilities of the extension experts	3.58	0.982
32	Utilize the capacity of popular organizations in providing extension services	3.79	0.963
33	The appropriate notification of extension service schedule timing, and location of the extension service	3.87	0.811
34	Give accurate information to researchers to know the exact problem of each area	3.84	0.925
35	The effectiveness of extension services in improving agricultural production quality	4.24	0.925
36	The effectiveness of extension services in increasing yield of agricultural products	4.39	0.790
37	Effective and useful services offered for reducing production costs	4.54	0.836
38	Effective and useful services offered for increasing farmers' incomes	4.66	0.708
39	Effective and useful services provided to solve problems of farmers	4.41	0.927
40	The tangibility of the results and effects of the use of extension services in increasing the value added of production	4.19	0.889
41	Effective and useful services offered in promoting the knowledge and technical skills of farmers	4.32	0.933
42	Helping the comfort and convenience of farmers	4.00	0.956
43	Useful and effective services to reduce the risks of productive activities	4.00	0.936
44	Having the extension system of adequate funding and budget	4.00	0.915
45	Quantitative and qualitative suitability of educational and support facilities for the provision of extension services	3.87	0.991
46	Physical and mental support from farmers for the use of extension services	3.95	0.941
47	Paying attention to the real needs and expectations of farmers in providing extension services	4.37	0.883
48	Audience-based extension programs and activities on the farmer	4.32	0.904
49	Participation of farmers in the planning, implementation, and evaluation of extension services	4.32	0.956
50	Designing an appropriate work plan for extension experts and researchers	3.97	0.854
51	Effective management and planning of services provided to farmers	4.21	0.843
52	Participation of farmers in implementing research projects	4.16	0.973
53	A tendency to reuse extension services	3.76	0.969
54	The number of farmers' referrals to the extension experts	3.76	0.975
55	The amount of practical use of extension services	4.22	0.821
56	Reliable and credible AREEO	3.79	0.992

equaled or exceeded 80% remained in the research. As indicated in Table 4, 37 components for assessing farmer satisfaction with extension services were determined by the panel of experts.

The second purpose of this study was to categorize the satisfaction components of extension services and determine the factors of satisfaction of extension services. By using a constant comparative method (Glaser and Strauss, 1967), the 37 components were classified into four main factors. As mentioned in Table 5, satisfaction components identified in round three were categorized into technical and

professional features of the extension experts, quality of service, perceived effectiveness, and policy, management, and planning.

DISCUSSION

There were two objectives for this study; hence, two conclusions were acquired. The first objective was to identify the components of satisfaction assessment of extension services in Iran. Thirty-seven indicators or statements were recognized. Among them, " Friendly, polite and

**Table 4.** Round Three: Level of Agreement with satisfaction components of extension services (n= 42).

Rank	Components	Agree (%)
1	The professional competence of extension experts	90.5
2	The responsibility of extension staff	88.1
3	The ability of extension experts to solve farmers' problems	81.0
4	Friendly, polite and respected greeting approach of extension experts with farmers	92.9
5	The up-to-date information and knowledge and technical skills of extension experts	88.1
6	Use common language and understand farmers	85.7
7	Effective and appropriate interaction between experts and farmers	88.1
8	The ability of experts to provide fast and timely service to farmers	81.0
9	Provide correct and complete services to farmers	81.0
10	Fulfill commitments and build trust	85.4
11	Provide timely information to attraction farmers' trust	85.7
12	Applicability and practicality of the provided services	88.1
13	Adaptability of extension services with local agricultural production facilities	83.3
14	Pay attention to the appropriate time according to the production calendar for the provision of extension services	85.7
15	Observe the cultural and social issues of the local community in providing services	92.9
16	Provide continuous services to farmers	81.0
17	Time and locative flexibility of extension services	88.1
18	Easy availability for farmers to extension services, information and communication resources, and experts	88.1
19	Using various appropriate and participatory methods and channels to determine farmers' needs and provide extension services to farmers.	85.7
20	The suitable utilization of information and communication technology in extension activities	83.3
21	Utilize the capacity of popular organizations in providing extension services	81.0
22	The appropriate notification of extension service schedule	85.7
23	The effectiveness of extension services in improving agricultural production quality	85.7
24	The effectiveness of extension services in increasing yield of agricultural products	88.1
25	Effective and useful services offered for reducing production costs	85.7
26	Effective and useful services offered for increasing farmers' incomes	85.7
27	Effective and useful services provided to solve problems of farmers	83.3
28	The tangibility of the results and effects of the use of extension services in increasing the value added of production	85.7
29	Effective and useful services offered in promoting the knowledge and technical skills of farmers	85.7
30	Useful and effective services to reduce the risks of productive activities	81.0
31	Suitability of educational and support facilities for the provision of extension services	81.0
32	Paying attention to the real needs and expectations of farmers in providing extension services	81.0
33	Audience-based extension programs and activities	85.7
34	Participation of farmers in the planning, implementation, and evaluation of extension services	81.0
35	Designing an appropriate work plan for extension experts and researchers	81.0
36	Effective management and planning of services provided to farmers	81.0
37	The amount of practical use of extension services	83.3

respected greeting approach of extension experts with farmers ", " Observe the cultural and social issues of the local community in providing services", and " professional competence of extension experts" had the highest agreement among respondents, as they indicated the main components of the assessment of service satisfaction.

This study showed that the individual characteristics of extension experts such as professional competence and polite behavior

concerning farmers are one of the most important factors in assessing farmers' satisfaction with extension services. These findings are in line with the findings of YazdanPanah and Rahimi Feyzabad (2017), which was obtained using the American Customer Satisfaction Index (ACSI). Therefore, as customer-orientation (Martinelli *et al.*, 2015; Arokiasamy, 2013) in the new business is of strategic importance, providing farmer services and polite and respectful behavior is also of great

Table 5. Categorization of the satisfaction components of extension services in Iran.

Factors	Sub-factors	Components
Technical and professional features of the extension experts		The professional competence of extension experts
		The responsibility of extension staff
		The ability of extension experts to solve farmers' problems
		Friendly, polite and respected greeting approach of extension experts with farmers
		The up-to-date information and knowledge and technical skills of extension experts
		Use common language and understand farmers
		Effective and appropriate interaction between experts and farmers
Quality of services	Trustiness	The ability of experts to provide fast and timely service to farmers
		Provide correct and complete services to farmers
		Fulfill commitments and build trust
		Provide timely information to attraction farmers' trust
	Service features	The amount of practical use of extension services
		Applicability and practicality of the provided services
		Adaptability of extension services with local agricultural production facilities
		Pay attention to the appropriate time according to the production calendar for the provision of extension services
		Suitability of educational and support facilities for the provision of extension services
		Observe the cultural and social issues of the local community in providing services
Communication features in the provision of services	Provide continuous services to farmers	
	Time and locative flexibility of extension services	
	Easy availability for farmers to extension services, information and communication resources, and experts	
	Using various appropriate and participatory methods and channels to determine farmers' needs and provide extension services to farmers.	
Perceived effectiveness		The suitable utilized of information and communication technology in extension activities
		Utilize the capacity of popular organizations in providing extension services
		The appropriate notification of extension service schedule
		The effectiveness of extension services in improving agricultural production quality
		The effectiveness of extension services in increasing yield of agricultural products
		Effective and useful services offered for reducing production costs
		Effective and useful services offered for increasing farmers' incomes
		Effective and useful services provided to solve problems of farmers
The tangibility of the results and effects of the use of extension services in increasing the value added of production		
Policy, Management, and Planning		Effective and useful services offered in promoting the knowledge and technical skills of farmers
		Useful and effective services to reduce the risks of productive activities
		Paying attention to the real needs and expectations of farmers in providing extension services
		Audience-based extension programs and activities
		Participation of farmers in the planning, implementation, and evaluation of extension services
		Designing an appropriate work plan for extension experts and researchers
		Effective management and planning of services provided to farmers

importance. Also, from the customer-oriented components of the extension services, one can point out the consideration of cultural and social issues, as mentioned in the research by Martinelli *et al.* (2015). The responsibility of extension experts, which is identified in this research as an important characteristic in assessing farmers' satisfaction with extension services, has been confirmed in numerous studies (Yazdanpanah and Rahimi Feyzabad, 2017;

Fosu-Mensah *et al.*, 2012; Ebrahimi and Imani, 2014).

Another indicator, in addition to the characteristics of experts, is the features and methods of service delivery, which include flexibility in location and time of provision of services, easy access, and the applicability of extension services. Studies by Elias *et al.* (2015) and Ganpat *et al.* (2014) support these findings. This suggests that in addition to the characteristics of the



experts, techniques, and features related to the transfer of technology can also be considered in assessing farmers' satisfaction with the extension services as an important indicator (Gunes *et al.*, 2016).

As to the second objective and the panel experts' view about factors of satisfaction of extension services, 4 categories were elicited: Technical and professional features of the extension experts, quality of service, perceived effectiveness, and policy, management, and planning. The quality of service as one of the factors of satisfaction with extension services in this study is similar to that of ACSI and ECSI (Askariazad and Babakhani, 2015; Yazdanpanah and Rahimi Feyzabad, 2017). Determining the sub-factor of the service features in this study (Table 5) are similar to the quality of hardware in the ECSI and sub-factor the trustiness and communication characteristics (Table 5) are similar to the software quality in this index (Grigoroudis and Siskos, 2010; Fornell *et al.*, 1996).

In this categorization, determining the technical and professional features of the extension experts as an independent factor in customer satisfaction assessment indicates the importance of this indicator in assessing the satisfaction of extension services, while these features are on the ACSI within the Quality of Service Provider (Yazdanpanah and Rahimi Feyzabad, 2017; Grigoroudis and Siskos, 2010). The reason for this is the non-competitive and participatory nature of the extension services (Elias *et al.*, 2015). On the other hand, most of the extension services provided have an educational and advisory aspect (Ganpat *et al.*, 2014).

Another factor affecting farmers' satisfaction in this study is the perceived effectiveness. This factor does not exist in other indicators of customer satisfaction like ACSI and ECSI. This factor shows the effectiveness of the extension services in improving quality, increasing performance, reducing costs, increasing income, and reducing the risk of manufacturing activities (Table 5). The low impact of extension services on outputs of the agricultural

production system has always been one of the weaknesses of the agricultural system in Iran (Karbasioun *et al.*, 2008; Gorji *et al.*, 2012; Haji-Mirrahimi, 2016). Therefore, paying attention to improving and increasing the expected outcomes of farmers can improve farmers' perspective towards extension services and thus increase satisfaction with extension services.

Another factor in satisfaction research, which is illustrated by the image of the brand's popularity is the service provider (Brown *et al.*, 2010), has been emphasized in this research as Policy, Management, and Planning. This factor, which consists of 6 components, unlike the ECSI, which depicts the customer's mental image of the company (Brown *et al.*, 2010; Suh and Houston, 2010; Cretu and Brodie, 2007) has paid attention to the plans and executive management of the organization and has more physical aspects. This factor is due to the top-down planning of the extension system in Iran (Abbasi *et al.*, 2015), the non-participation of farmers in the process of monitoring the extension services (Hashemi and Hejazi, 2011), the lack of attention to the real needs of the farmers (Haji-Mirrahimi, 2016), and the lack of credit and support resources (Moradi and Poorsaeid, 2014), explains the extension system in Iran well, and alone can be a good indicator for measuring satisfaction with extension services.

Some important recommendations can be described as follows:

Given that extension services in Iran are provided in a non-competitive public and free environment, it is suggested to use the Iranian Farmers' Satisfaction Index (IFSI) rather than the American or European Consumer Satisfaction Index (ASCI/ESCI) to measure farmers' satisfaction, as these indicators are designed for a competitive and goods-oriented environment.

Given the nature of extension services that rely on enhancing farmers' professional knowledge and performance, the perceived effectiveness factor can replace the perceived value. Therefore, instead of evaluating the cost-benefit of services,

components such as the useful and effectiveness of the extension services in improving product quality, increasing performance, reducing costs, solving farmers' problems, and reducing production risk are suggested.

Given the specialization field of the majority of extension experts, training courses such as problem-solving and effective communication and interaction with farmers to enhance their professional knowledge along with their technical knowledge should be considered by planners.

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تدوین شاخص‌های رضایتمندی کشاورزان از خدمات ترویج در ایران با استفاده از تکنیک دلفای

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چکیده

پاسخگو نبودن سازمان‌های دولتی به رفع نیازهای ذینفعان و بخش خصوصی و ارائه خدمات با کیفیت پایین به مشتریان، باعث افزایش نارضایتی از خدمات دولتی شده است. بنابراین، ارائه خدمات با کیفیت به منظور افزایش رضایت از سازمان‌های دولتی ضروری است. خدمات ترویجی یکی از مؤلفه‌های اصلی توسعه پایدار کشاورزی در ایران محسوب می‌شود که از طریق سازمان تحقیقات، آموزش و ترویج کشاورزی (AREEO) به کشاورزان ارائه می‌شود. سطح پایین رضایت کشاورزان از خدمات ترویج، توسعه سامانه ارزیابی رضایت کشاورزان را به عنوان یک پروژه استراتژیک مورد تأکید قرار داده است. بنابراین این مطالعه با هدف تدوین مؤلفه‌های شاخص رضایت کشاورزان از خدمات ترویج و تعیین عوامل موثر بر رضایت آنها در سال ۲۰۱۹ اجرا شده است. در این مطالعه از روش دلفای کلاسیک در سه دور استفاده شده است. پانل خبرگان شامل نه نفر عضو هیئت علمی دانشگاه، ۱۴ عضو هیئت علمی AREEO و ۱۹ کارشناس ترویج ستاد (۴۲ نفر) بود. نتایج دلفای منجر به تعیین ۳۷ مؤلفه برای ارزیابی رضایتمندی



کشاورزان از خدمات ترویج شد. این مؤلفه‌ها با استفاده از روش مقایسه‌های ثابت در چهار عامل اصلی طبقه‌بندی شدند. این عوامل عبارتند از: ویژگی‌های فنی و حرفه‌ای کارشناسان ترویج، کیفیت خدمات، اثربخشی درک شده و سیاست‌گذاری، مدیریت و برنامه‌ریزی.