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Factors Affecting the Use of ICT among Agricultural Experts and Farmers in East Azerbaijan province, Iran

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Abstract: *Information and communication technologies (ICTs) have affected all sectors, including the agricultural sector. To realize agricultural and rural development, it is essential for agricultural actors to use ICTs. Farmers and agricultural experts are the main actors in this section. In this study, 206 farmers and 124 agricultural experts from East Azerbaijan Province were selected to examine factors affecting their use of ICTs. The results were indicated the purpose of using ICTs and job experience are the factors affecting using the ICTs by farmers. Access to ICTs, the purpose of using ICTs, and job experience were three factors that had affected using the ICTs by experts.*

Keywords: Agricultural Expert, Farmer, Factors, Information and Communication Technology, Using

INTRODUCTION

The agricultural sector serves as one of the most important economic sectors in many developing countries, including Iran. Agriculture accounts for 12 percent of Iran's GDP (Statistics Center of Iran, 2011). The importance of the agricultural sector in Iran's economy as a developing country is related to its purposes such as food security and environmental sustainability, entrepreneurship, employment and income generation, export growth, and the mobility of the other sectors (Sharifzadeh *et al.*, 2014). The agricultural sector in most countries, especially developing countries, will face several challenges in the coming decades. These challenges are the supply of food for a growing population, general development and poverty alleviation, water and land resources limitation, climate change, biodiversity conservation, vulnerable ecosystems (OECD, 2011), and the evolution of this sector due to the rapid pace of technological changes, markets, and policies (Danne, 2010).

According to Stienen, Bruinsma, and Neuman (2007), Information and Communication Technologies (ICTs) play an important role in addressing these challenges and raising the livelihood of small-scale farmers. They point out that the role of ICTs in increasing food security and support for rural livelihoods has been increasingly recognized and endorsed at the World Summit on the Information Society (WSIS) between 2003 and 2005.

ICTs refer to components such as computer, hardware, software, data management technology, and network and telecommunication technology, which help us face and manage changes (Laudon and Laudon, 2012).

The progress of farmers in their work largely depends on awareness, access, use and communication with accurate and reliable information (Nenna, 2016). Lack of access to information is one of the main problems for farmers in developing countries (Gollakota, 2008). In many developing countries, ICTs are used to disseminate the extension services and improve agricultural practices and techniques.

ICTs are needed for an effective agricultural extension because they have the potential to reach broader audiences and are effective in capacity building of the end users (Oladele, 2011). ICTs facilitate the communication role of agricultural extension by reducing the costs of information convey to farmers and eliminating the physical distance among agricultural actors. (Arkhi *et al.*, 2008). They create the opportunity to network farmers each other to get information (IFAD, 2008). By using ICTs, extension agents can make access to specialized knowledge or types of information to facilitate farmers' daily activities (Omotayo, 2005). Farmers who do not have access to ICTs may experience digital poverty, increased risk, and labor costs, which will further limit their ability to innovate and participate in markets (Okello *et al.*, 2014).

Various factors affect using ICTs in agriculture, such as accessibility and availability of ICTs, the skills and knowledge of users to apply these technologies, adequate infrastructure, and suitable situation for the use of ICTs such as financial situation (Sharifzadeh *et al.*, 2008; Lawal- Adebowale *et al.*, 2014; Singh & Yuvaraj, 2012; Ospina and Heeks, 2012; Mtega and Msungu, 2013; OECD, 2016; WorldBank, 2011, 2017). Also, socio-demographic characteristics influence the use of ICTs (Nenna, 2016; Olaniyi *et al.*, 2013; Rastegari and Nooripoor, 2016; Iorliam *et al.*, 2012; Ghasemi *et al.*, 2011).

Several studies have pointed out that technologies such as radio, TV, mobile phone, and fixed phone are the most essential tools for the majority of farmers and extension agents to access and use them to receive and transform information (Nenna, 2016; Ajani and Agwu, 2012; Freeman and Mubichi, 2017; Fawole and Olajide, 2012; Syiem and Raj, 2015; Iorliam *et al.*, 2012; Samansiri and Wanigasundera, 2014; Jimenez, 2013; Agada & Akpan, 2017). According to Farajollah Hosseini and Niknamami (2006), radio, fixed telephone, TV, and print materials are considered the most appropriate technologies for Iranian agricultural extension system. Also, Falaki *et al.* (2008) stated that the use of ICT among Iranian extension experts is at a low level.

ICTs use for various purposes, such as social communication, contact with experts for agricultural advice, the provision of information on climate, soil, and plant and animal diseases; access to information on market prices for crops, livestock and agricultural inputs, carrying out job duties, and finding the special and general information (Ajani and Agwu, 2012; Syiem and Raj, 2015; Ghasemi *et al.*, 2011).

An effective and productive agricultural system needs to benefit from efficient and up-to-date information and also use the power of ICTs. With the advent of the new approach of the Iranian Agricultural Extension System (named as New Extension System), more and more attention has been paid to ICTs to further utilize these technologies for the dissemination of knowledge and information and the delivery of educational services to farmers. East Azerbaijan province is one of the most

important agricultural areas in Iran and is the leading province in the implementation of the new approach of the agricultural extension system.

There is a need to be aware of the status of access to ICTs, ICTs utilization, and the purpose of using the ICTs among agricultural stakeholders before integration ICTs to the agriculture sector. This knowledge will help planners formulate effective policies for the use of ICTs in this sector. Therefore, this study examines the ICT tools used by farmers and agricultural experts as the main actors and stakeholders of agriculture. The overall objective of the present study is to determine the factors underpinning the use of ICTs by farmers and agricultural experts and specifically addresses the following objectives:

- Determining the status and place of access to ICTs by farmers and agricultural experts;
- Determining the frequency of the use of ICTs by farmers and agricultural experts;
- Determining the factors affecting the use of ICTs.

Materials and Methods

The present study is quantitative regarding its nature and non-experimental regarding the degree of the variables and applied regarding its goals. It was carried out as a descriptive-correlational study.

The research population consisted of farmers and agricultural experts in East Azerbaijan province, Iran.

Agricultural experts included agricultural experts working in agricultural zones in public extension system (new extension system of Iran divides each city into agricultural zones according to the size and population of villages. Each zone consists of one or more villages. Every agricultural expert is responsible for the extension, education and agricultural affairs of a single zone.) and agricultural experts of agricultural consultancy services firms (they are experts in cooperative firms that work under the Ministry of Agriculture and provide consultancy and technical services to farmers). They called to as experts in this study.

Farmers included all those who worked in agriculture, horticulture, and animal husbandry areas.

206 farmers and 124 agricultural experts from three townships of East Azerbaijan province were selected as the sample by Cochran's sample size formula.

Farmers were selected by multistage cluster sampling method. A multi-stage random sampling method was used to select the agricultural experts. First, three cities of East Azerbaijan province purposively, and then the experts of the agricultural zones and agricultural consultancy services firms of these cities were selected using a stratified sampling method with an equal assignment among the classes (Table 1).

Table1. The statistical distribution of the agricultural experts and farmers and extracted sample

Selected community	Zone	Sample size
Agricultural experts: public extension system, agricultural consultancy services firms (1078 person) sample size: 124	agricultural consultancy services firms of Maragheh	21
	public extension system of Maragheh	21
	agricultural consultancy services firms of Tabriz	21
	public extension system of Tabriz	20
	agricultural consultancy services firms of Malekan	20
	public extension system of Malekan	21
Farmers (224000 person) sample size: 206	3 Rural districts of Maragheh	69
	2 Rural districts of Tabriz	68
	4 Rural districts of Malekan	69

Two questionnaires collected the data used for this study; one questionnaire for farmers and the other for experts.

Farmers' questionnaire had four sections including accessibility and usage of ICT; the frequency of web-based tools utilization; the purpose of using the ICTs; and in final section was questioned the demographic and farming characteristics of respondents.

Experts' questionnaire was composed of four sections including access and place of access to ICTs; the frequency of web-based tools utilization; the purpose of using the ICTs; and final section questioned the demographic and institutional characteristics.

Content and face validity of two questionnaires was confirmed by a panel of faculty members of agricultural extension department of Tarbiat Modares University of Iran, experts from the Ministry of Agriculture of Iran (Jihad-e-Keshavarzi) and Agriculture Organization of East Azarbaijan province. Reliability of farmer' questionnaire was provided by doing a pre-test in a similar community in one village of East Azerbaijan province (except selected villages) with 30 farmers. Also, a pre-test was accomplished in a similar community in East Azerbaijan province (Except selected Townships) with 30 agricultural experts. Cronbach's Alpha coefficient was calculated for the items that were questioned by the ordinal scale (Table 2).

Table 2. Cronbach's Alpha for questions with ordinal scales

Population	Items	No of Items	Cronbach's Alpha
Farmer	Purpose of using the ICTs	21	0.92
Agricultural Experts	Access to ICTs	23	0.89
	The purpose of using ICTs	27	0.92
	The frequency of web- based tools utilization	14	0.70

After the questionnaires were completed out by the farmers and experts, all data were analyzed using SPSS22. Descriptive statistics items (mean, frequency, percentage, and standard deviation) and the linear regression model were used to analyze data.

Results and Discussion

A. Demographic Characteristics of Respondents

The demographic characteristics of farmers indicated that the mean age of the farmers was 42.62 years with the highest frequency (mode) belonging to those aged 30. Slightly more than half of them are older than 41 years old, which shows that the farmers were middle-aged.

Almost all farmers were male, and just one was female. The average duration of their farming experiences was 27.02 years, the lowest being two years and the highest being 70 years. The highest frequency (mode) belonged to 30 years. More than half of the farmers' monthly income was between 98 € and 196 € (5 million-10 million Iranian Rials), and income of %89.7 of them was below 392€ (20 million Iranian Rials), which shows the farmers were poor.

Frequency distribution of farmers' educational level showed that farmers with a diploma (44 people) had the highest frequency and farmers having an associate degree (16 people) had the lowest rate. It is noteworthy that more than half of the respondents (54.3%) did not have a diploma certificate and one-third of respondents (38.7%) were poorly educated or illiterate.

The results showed that 171 farmers (84.1%) were living in the village and 30 farmers (14.9%) were living in the city.

The average area of land among the farmers was 5.16 hectares with a standard deviation of 6.36. Two-thirds of farmers (72.6%) had less than 5 hectares, and nearly half of the respondents (48.7%) had less

than 2 hectares, which shows the farmers were smallholders. Land ownership for 84.2% of farmers was private.

The demographic characteristics of the agricultural experts are shown in Table 3. According to the findings, the mean age of the agricultural experts was 35 years (SD = 7.10), and the highest frequency (mode) belonged to those aged 37, which shows that the experts were young. Half of the experts (51.7%) belonged to the age range of 31-40 years while only 2.5% belonged to the age range of older than 51 years.

Gender of the majority of the experts (57%) was male, and 43% were female. The average job experience was 8.03 years, and 52.9% of researchers belonged to the job experience range of 1-5 years. The highest frequency (mode) belonged to 3 years, showing that the experts were lowly experienced. The educational level of 60.7% of the respondents was a Bachelor's degree, and 36.9% of experts had a master's degree. The average area of land among the farmers was 5.16 hectares with a standard deviation of 6.36. Two-thirds of farmers (72.6%) had less than 5 hectares, and nearly half of the respondents (48.7%) had less than 2 hectares, which shows the farmers were smallholders. Land ownership for 84.2% of farmers was private.

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B. Access to ICTs

Access to ICTs is a necessary condition for realizing the potential benefits of ICTs. Table 3 shows the ICT tools available to the farmers. The survey revealed that Telephone, TV, mobile phone, and radio were the main technologies available to most farmers. Almost all farmers had fixed phone, and the TV was available for most of them (97.1%). The Internet as an important ICT was available for 60% of farmers and computer as another important modern ICT was available for half of the respondents (53.4%). Several studies on evaluating ICTs among farmers have also mentioned the telephone, mobile phone, TV, and radio (Rimi and Chudi, 2017; Fawole & Olajide, 2012; Olaniyi *et al.*, 2013; Syiem and Raj, 2015; Ajani & Agwu, 2012; Freeman and Mubichi, 2017; Masuki *et al.*, 2010; Nenna, 2016; Iorliam *et al.*, 2012) as the most common ICT tools among the majority of the farmers.

Table 4 presents the use of ICTs by farmers. Fixed phone, mobile phone, radio, and TV are the main technologies used by farmers. This result has been expressed in other studies too (Fawole & Olajide, 2012; Syiem and Raj, 2015; Ajani & Agwu, 2012; Freeman and Mubichi, 2017; Masuki *et al.*, 2010; Nenna, 2016; Iorliam, Imbur and Iortima, 2012).

Table 3. Access to ICTs among farmers (n= 206)

Tool	Frequency	Percent
Computer	110	53.4
Video recorder	98	47.6
Digital Camera	47	22.9
Internet	125	60.7
GPS	13	6.3

Printer	41	19.9
Scanner	18	8.7
Fixed Telephone	205	99.5
Mobile Phone	179	86.9
Fax	12	5.8
Smart Phone	125	60.7
Radio	165	80.1
TV	200	97.1
CD, DVD	55	26.7
Mobile phone Apps	91	44.2
Social media on Mobile Phone	111	53.9

Table 4. Using the ICTs among farmers (n= 206)

Tool	Frequency	Percent
Computer	86	41.7
Internet	108	52.4
telephone	205	99.5
Mobile phone	179	86.9
radio	163	79.1
TV	190	92.2
CD, DVD	54	26.2

Table 5 shows the accessibility of the experts to ICTs. Results indicated that basic ICTs were available for experts. Almost all respondents (97.6%) accessed computer, and all of the experts accessed the Internet as essential tools of modern ICTs. The majority of respondents (88.7%) accessed printer, 82.9 percent of the experts accessed the digital camera, 78.9 percent of them accessed GPS, and the scanner was available to 70.2 percent of experts. Also, Web-based tools, which are now important communication and information tools, had a good place among respondents. Results indicated the local and international online databases tools, which provide free or low-cost access to journals and information on agriculture and related sciences, were available for 50% of experts and 25% of them. Also, 48.4%of respondents accessed CD-ROMs containing the abstracts and findings of agricultural research. Almost three-quarters of the experts did not have access to Data Analysis Software (such as SPSS, SAS, etc.) and less than half of the experts had access to Data Visualization Software (Arc GIS, ArcView), but the majority of them (85.5%) had access to Applied Software (Microsoft Office).
Web 2.0 based tools (social media), which today are important communication and information tools, have a good place among respondents. Most respondents (91.1%) said they accessed web 2.0-based tools and 87.9 percent of them had access to Web 2.0 based messengers.

Table 5. access and place of access to ICT tools among Experts (%)

Item	Not access	access						
		office	home	private centers	Both home and office	both in office & private centers	both home & private centers	All places
Computer	2.4	25	19.4	5.6	36.3	3.2	4	4
Laptop	23.1	8.3	64.5	0.8	2.5	-	-	0.8
Mobile phone	-	-	100	-	-	-	-	-
Internet	-	17.7	23.4	4	36.3	6.5	-	12.1
Digital Camera	17.1	23.6	35	7.3	17.1	-	-	-
Video recorder	39.5	10.5	35.5	4	9.7	-	-	0.8
GPS	21.1	40.7	22	8.1	4.9	0.8	1.6	0.8
Printer	11.3	41.9	10.5	9.7	15.3	8.9	1.6	0.8
Colour Printer	53.2	15.3	7.3	17.7	1.6	4	0.8	-

Scanner	29.8	32.3	12.1	12.1	4	8.9	0.8	-
CD-ROM	48.4	19.4	12.9	5.6	10.5	0.8	1.6	0.8
Local online database	50	15.3	8.9	4	3.2	0.8	0.8	-
International online databases	75	32.3	4.8	4	0.8	-	-	-
Smart phone	46	2.4	49.2	-	-	-	0.8	1.6
Fixed phone	4	16.9	31.5	4	29.8	-	5.6	8.1
Colour copier	60.5	16.1	4	15.3	1.6	0.8	1.6	-
Fax machine	26.6	45.2	8.1	9.7	1.6	1.6	7.3	-
Data Visualization Software (Arc GIS, ArcView)	54	13.7	8.9	6.5	12.1	0.8	4	-
Applied Software (Microsoft Office)	14.5	18.5	19.4	4	31.5	-	4	8.1
Data Analysis Software (SPSS,SAS)	73.4	6.5	16.1	2.4	0.8	0.8	-	-
Web 2.0 based Tools	8.9	13.7	67.7	-	13.7	2.4	4	1.6
Mobile phone apps	26.6	2.4	67.7	-	0.8	-	0.8	1.6
Web 2.0 based messengers (Telegram...)	12.1	1.6	77.4	-	4.8	-	2.4	1.6

C. Purpose of using the ICTs

The frequency of different purposes for the use of ICT tools is shown in tables 6 and 7. According to results in Table 7, the item "Chatting and sending messages" had the highest mean and was in the first rank, the item "Information acquisition" was in the second rank, the item "Communicating with other farmers" was in the third rank, and the item "Sharing information" was in the fourth rank among farmers.

The use of ICTs for chatting and sending messages was between high and very high. The ICTs were found to be used for most purposes at a low or very low level except for “information acquisition,” “communicating with other farmers,” “communicating with agricultural experts,” “studying electronic magazines and newspapers,” and “saving online documents.”

Chatting and sending messages is the most common purpose of using ICTs among farmers because the majority of respondents had a mobile phone and it is easy to use mobile phones with no requirement of a particular skill and education and literacy.

According to results in Table 8, the item "Chatting and sending messages" had the highest mean and was in the first rank, the item "Carrying out job tasks" was in the second rank, the item "Information acquisition" was in the third rank, and the item "Finding educational materials and resources" was in the fourth rank among experts.

The use of ICT for information acquisition, finding educational materials and resources, chatting and sending messages, carrying out job tasks and information sharing were at a low to moderate level, which is in agreement with the findings of Ghasemi *et al.* (2011) Ajani and Agwu (2012) and Syiem & Raj (2015).

Based on the results, the average utilization rate was between low to very low for 20 items. That means that there is still not a great use of ICT capabilities. Falaki et al. (2008) also pointed to the low use of ICTs by agricultural experts in Iran.

Table 6. Different purpose of the use of ICT Tools by Farmers

Item	Mean[a]	SD	Rank
Chatting and sending messages	4.13	1.42	1
Information acquisition	3.31	1.54	2

Communicating with other farmers	3.31	1.65	3
Sharing information	2.94	1.64	4
Fun	2.89	1.81	5
Communicating with agricultural agents and experts	2.87	1.70	6
Sharing pictures, photos, and videos	2.70	1.70	7
Finding educational materials and resources	2.67	1.54	8
Participation in discussion	2.59	1. 54	9
Acquiring awareness about new issues and challenges in the agricultural sector	2.44	1.46	10
Familiarity with new agricultural initiatives and agricultural innovations	2.40	1.54	11
Uploading event pictures	2.31	1.71	12
Uploading video clips	2.27	1.64	13
Downloading music and games	2.26	1.64	14
Doing administrative affairs	2.24	1.46	15
Buying and selling of agricultural inputs and products	2.21	1.53	16
Transmit of files and texts	2.09	1.51	17
Promotion of occupational competencies	2.07	1.43	18
Communicating with agricultural experts	2	1.38	19
Study of electronic magazines and newspapers	1.99	1.39	20
Use for saving online documents	1.92	1.35	21

Note. **a** Mean ranges from 0 to 6. 0=not at all, 1=very low, 2=low, 3=moderate, 4=high, 5=very high
The mean used to rank items, and the standard deviation item used for ranking in the case of equal mean.

Table 7. Different purpose of the use of ICT Tools by Experts

Item	Mean[a]	SD	Rank
Chatting and sending messages	3.98	1.01	1
Carrying out job tasks	3.96	1.13	2
Information acquisition	3.73	0.97	3
Finding educational materials and resources	3.38	1.12	4
Sharing information	3.23	1.17	5
Meeting new people	3.06	1.23	6
Participation in discussion	2.98	1.35	7
Presentation of audio-visual information	2.96	1.37	8
Sharing pictures, photos, and videos	2.76	1.40	9
Introducing new agricultural initiatives and agricultural innovations	2.72	1.28	10
Study of electronic magazines and newspapers	2.66	1.49	11
Engaging in collaborative research	2.61	1.34	12
Transmit of files and texts	2.56	1.44	13
Launching agricultural news / creating awareness of new agricultural issues and challenges	2.37	1.39	14
Fun	2.33	1.46	15
Mobilizing stakeholders to hold scheduled meetings	2.31	1.50	16
Making links with research institutions	2.29	1.44	17
Online reference databases (Wikipedia, Encyclopedia)	2.25	1.55	18
stakeholders networking	2.01	1.39	19
Using to create, save and edit online documents and spreadsheets	1.99	1.46	20
Uploading event pictures	1.96	1.59	21
Buying, selling and doing business	1.93	1.63	22
Online counseling	1.93	1.64	23
Downloading music and games	1.84	1.58	24
Publishing and maintaining blogs	1.71	1.53	25
Video conference	1.69	1.49	26
Uploading video clips	1.68	1.60	27

Note. **a** Mean ranges from 0 to 6. 0=not at all, 1=very low, 2=low, 3=moderate, 4=high, 5=very high
The mean used to rank items, and the standard deviation item used for ranking in the case of equal mean.

D. The frequency of using the web-based tools

Given the importance of the web-based tools for daily works, the frequency of using these tools was evaluated that results summarize in Tables 8 and 9.

Findings in Table 8 indicate that 26.7% of the farmers expressed they use Web 2.0 based messengers such as Telegram; more than half of the farmers (54.9%) use these tools. Half of the farmers use search engines, and one-third of them used e-mail. Also, the majority of the farmers did not use agricultural blogs and Wikipedia.

Given the fact that farmers in these areas speak Turkish, the low use of these tools can be attributed to the low level of literacy and the lack of knowledge of English and Persian.

Findings indicated that 66.9% of the experts expressed they use search engines every day and 39.5% use electronic services provided by MS-Office every day. Also, 29% reported the daily use of web 2.0 based messengers such as Telegram.

E-mail, search engine, electronic services provided by their office, and Web 2.0 based Messengers such telegram are tools that are highly utilized by agricultural experts. This refers to good access to tools such as computers and mobile phone devices and Web 2.0 based tools, and their good knowledge of these tools. Lack of using other tools can be attributed to the ignorance of the experts about the feature of these tools.

Table 8. The extent of using different Web-Based Tools by Farmers (%)

Used tool	Daily	2 -3 times on week	More than three times on week	Once in 2weeks	monthly	At all
Web 2.0 based Messengers such telegram	26.7	8.3	8.7	4.4	5.8	46.1
Search engines such as Google	6.8	8.3	9	9.7	13.1	51.5
E-mail	4.4	1.5	4.4	8.3	18.9	62.6
Blogs	3.4	3.4	2.9	6.8	4.4	79.1
Wikipedia	1.9	2.4	1.9	5.3	8.7	79.6

Table 9. The extent of using different Web-Based Tools by Experts (%)

Used tool	Daily	2 or 3 times on week	more than 3 times on week	Once in 2weeks	monthly	At all
Search engines such as Google	66.9	12.4	11.6	4.1	2.5	2.5
organizational website	39.5	11.3	13.7	7.3	12.1	16.1
Web 2.0 based Messengers such telegram	29	12.1	11.3	6.5	13.7	27.4
Specialized softwares in office	23.4	7.3	10.5	1.4	17.7	39.5
Local online databases	17.7	9.7	14.5	4	16.9	37.1
E-mail	16.4	26.2	8.2	12.3	27.9	9
Google +	10.5	8.1	8.1	8.9	17.7	46.8
Blogs	9.7	7.3	12.9	8.1	19.4	42.7
Wikipedia	8.1	16.1	9.7	9.7	12.9	43.5
LinkedIn	4.8	11.3	4	9.7	12.1	58.1
Slide sharing sites	4	5.6	7.3	5.6	9.7	67.7
Skype	3.3	3.3	7.3	2.4	8.9	74.8
International online databases	3.2	10.5	6.5	2.4	12.1	65.3
ResearchGate	1.6	8.9	8.9	5.6	10.5	64.5

E. Regression

The regression model (Enter model) was employed to predict the effect of independent variables on the ICTs using by farmers. The variables of age, literacy rate, residence place, agricultural job experience, cultivation area, income, land ownership (dummy coded), the purpose of using the ICTs and access to

ICTs entered in the regression equation and calculating the significance of each. Two independent variables had a significant effect on using ICTs. These variables were the "purpose of using the ICTs" (X1) and "agricultural job experience" (X2) (Table 10). The model of ICTs using by farmers is specified as follows:

$$Y = 11.041 + 0.177X_1(\text{purpose of using ICTs}) - 0.101X_2(\text{job experience})$$

Purpose of using ICTs and job experience explained 64.6% of the variation of ICT use among the farmers. Purpose of using the ICTs had positive effect and job experience had a negative effect on using the ICTs. If the job experience increases by one year, then using the ICTs score is reduced by 0.101.
Also, the regression model was employed to predict the effect of independent variables on the ICTs using by agricultural experts. The variables of age, educational status, gender (dummy coded), job experience, workplace (dummy coded), the purpose of using the ICTs and access to ICTs entered in the regression equation and calculating the significance of each. Three independent variables had a significant effect on using ICTs. These variables were the "purpose of using the ICTs" (X_1), "access to ICTs" (X_2) and "job experience" (X_3) (Table 11). The model of ICTs using by experts is specified as follows:

$$Y = 4.301 + 0.062X_1(\text{purpose of using ICTs}) + 0.045X_2(\text{access to ICTs}) - X_3(\text{job experience})$$

Purpose of using ICTs, access to ICTs and job experience explained 34.5% of the variation of ICT use among the experts. Purpose of using the ICTs and access to ICTs had a positive effect, and job experience had a negative effect on using the ICTs. If the job experience increases by one year, then using the ICTs score is reduced by 0.208.
In Ghasemi *et al.* (2011) study, the job experience was effective in explaining the use of ICTs by agricultural experts.

Table 10. Regression coefficients of variables influencing the ICT use by Farmers

Indicators	Unstandardized Coefficients		Standardized Coefficients	t value	Sig.
	B	Std. Error	Beta		
(Constant)	11.041	5.126		2.154	.033
X_1 purpose of using ICTs	.177	.019	.622	9.292	.000
X_2 job experience (year)	-.101	.047	-.184	-2.154	.033
R-square = 0.674		Adjusted R-square = 0.646			

Table 11. Regression coefficients of variables influencing the ICT use by Experts.

Indicators	Unstandardized Coefficients		Standardized Coefficients	t value	Sig.
	B	Std. Error	Beta		
(Constant)	4.301	2.959		1.453	.149
X_1 purpose of using ICTs	.062	.013	.379	4.666	.000
X_2 access to ICTs	.045	.014	.258	3.205	.002
X_3 job experience (year)	-.208	.072	-.397	-2.874	.005
R-square = 0.384		Adjusted R-square = 0.345			

Conclusion

Based on findings, half of the farmers had access to the computer, and more than half of them had access to the Internet as the main tools of modern ICTs. A very high percentage of farmers had access to radio and television, and almost all have fixed phone. Almost two-thirds of them had a cell phone

and social media apps on the cell phone. These results indicate that nearly half of the farmers still lack modern tools. Regarding ICT use, less than half of farmers used computers, and almost half of them used the Internet. The use of mobile phones, fixed phones, radio, and television was good. The low use of modern tools can be attributed to the low literacy and illiteracy of farmers and being old them. According to these results, for using these technologies for different purposes should pay attention to the level of literacy of farmers and their access to ICTs. Therefore, several methods and tools to be used simultaneously for information transfer so that all farmers covered. Farmers used ICTs to chatting and send messages, more. Given the level of literacy and the tools they had access, were expected to use for this purpose other purposes. Farmers used web 2.0 based messengers such as Telegram among web-based tools highest. Therefore, the capacity of this program to transmit various information and networking with other actors and farmers benefited.

Agricultural experts had good access to computers and the Internet, and they used web-based tools such as search engines, a lot.

Experts used more ICT to chatting and send messages, carrying out job tasks, and information acquisition. Still, use the ICTs for other aspects, such as online counseling and networking with actors, is not well among the experts. It was recommended to hold training courses on the applications of ICTs to improve the digital literacy and data skills among the experts.

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