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المجلة العراقية لبحوث السوق
وحماية المستهلك

PROBLEMS OF USING DIGITAL AGRICULTURAL EXTENSION IN PROVIDING AGRICULTURAL EXTENSION SERVICES FROM THE VIEWPOINT OF AGRICULTURAL EXTENSION AGENTS

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ABSTRACT

The research has aimed to determine the problems of using digital agricultural extension in providing agricultural extension services from the viewpoint of agricultural extension agents. The research population has included all agricultural extension agents who work in the Agricultural Extension and Training Department, the Training and Rehabilitation Center, the Agricultural Extension Center for Training, Al-Tarmiya Farm, as well as Al-Rashidiya Farm in Baghdad Governorate. The population consist of (100) agricultural extension agents, thus, a random sample has been taken from the research population at a rate of (83%). Accordingly, the proposed sample size has included (83) agricultural extension agents (from male and female). To achieve the goal of the research, a questionnaire has prepared that included two axes: the axis of administrative and financial problems, and the axis of technical and human problems, and the approval of the agricultural extension agents (male and female) has measured by asking them about the extent of the problem or non-existence of the problem, using the phrases (yes, no) and assigning degrees (0,1), and then identifying the extent of the impact of these problems (if they exist) using the phrases (low, medium, big) and grades were assigned to them (1,2,3), respectively. The results of the research have shown that most of the agricultural extension agents have indicated the existence of these problems as well as their direct impact on the use of digital agricultural extension in providing agricultural extension services to target audience, as the general impact rate of administrative and financial problems was (2.41) degree, and the rate of technical and human problems was (2.32) degree, so, these results may reflect the realism and objectivity of the problems addressed in the research, as well as their direct impact on the use of digital agricultural extension. Accordingly, the failure to confront and solve these problems will turn into a threat that prevent or fails the entire process, and in return, seeking to solve these problems and overcome them by the decision-making authorities in the Iraqi Ministry of Agriculture and the Agricultural Extension and Training Department in particular, will provide an appropriate environment and achieves a satisfactory level of efficiency and effectiveness in the process of using digital agricultural extension in providing agricultural extension services to the target audience.

Keywords: Administrative and financial problems, Technical and human problems, Digital agricultural extension, Agricultural extension service.

[*]**The research is taken from a master's thesis by the first researcher.**

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مشكلات استخدام الإرشاد الزراعي الرقمي في تقديم الخدمة الإرشادية الزراعية من وجهة نظر المُرشدين الزراعيين

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الخلاصة

يستهدف البحث تحديد مشكلات استخدام الإرشاد الزراعي الرقمي في تقديم الخدمة الإرشادية الزراعية من وجهة نظر المُرشدين الزراعيين، وقد شمل مجتمع البحث جميع المُرشدين الزراعيين العاملين في دائرة الإرشاد والتدريب الزراعي، ومركز التدريب والتأهيل، والمركز الإرشادي التدريبي الزراعي، ومزرعة الطارمية النموذجية، وكذلك مزرعة الراشدية النموذجية في محافظة بغداد، وقد ضم مجتمع البحث (١٠٠) مرشد زراعي، وأُخِذت عينة عشوائية بسيطة من مجتمع البحث وبنسبة (٨٣٪)؛ وعليه بلغ حجم العينة المقترح (٨٣) مُرشداً زراعياً (من الذكور والإناث)، ولتحقيق هدف البحث أُعدت استبانة ضمت محورين، وهي: محور المشكلات الإدارية والمالية (٧) فقرات، ومحور المشكلات التقنية والبشرية (١١) فقرة، في عملية استخدام الإرشاد الزراعي الرقمي؛ وتم قياس موافقة المُرشدين الزراعيين بسؤال المُرشد الزراعي (من الذكور والإناث) عن مدى تواجد المشكلة من عدمها بأستخدام عبارات (نعم ، كلا) وحددت لها الدرجات (0,1)، ومن ثم التعرف على مدى تأثير تلك المشكلات (في حال تواجدها) باستخدام العبارات (منخفض، متوسط، كبير) وحددت لها الدرجات(1,2,3) على الترتيب. وقد أظهرت نتائج البحث أن أغلب المرشدين الزراعيين قد أشاروا إلى تواجد هذه المشكلات فضلاً عن تأثيرها المباشر على استخدام الارشاد الزراعي الرقمي في تقديم الخدمة الارشادية الزراعية لجمهور المسترشدين، أذ بلغ معدل التأثير العام للمشكلات الادارية والمالية (٢,٤١) درجة، ومعدل المشكلات التقنية والبشرية (٢,٣٢) درجة، وقد يعكس ذلك واقعية وموضوعية المشكلات التي تم تناولها في البحث فضلاً عن تأثيرها المباشر على استخدام الارشاد الزراعي الرقمي؛ وعليه فأن عدم مواجهة وحل هذه المشكلات من شأنه أن يتحول إلى تهديد يعيق أو يفشل العملية بأكملها، وفي المقابل فأن السعي نحو حل هذه المشكلات وتذليلها من قبل الجهات المتخذة القرار في وزارة الزراعة العراقية ودائرة الإرشاد والتدريب الزراعي على وجهة الخصوص، من شأنه أن يوفر أرضية ملائمة ويحقق مستوى مُرضي من الكفاءة والفاعلية في عملية استخدام الإرشاد الزراعي الرقمي في تقديم الخدمة الإرشادية الزراعية إلى جمهور المسترشدين.

الكلمات المفتاحية: المشكلات الإدارية والمالية، المشكلات التقنية والبشرية، الارشاد الزراعي الرقمي، الخدمة الارشادية الزراعية.

INTRODUCTION

Today, the world countries are facing great challenges in the field of agricultural work and production (including Iraq), and at the forefront of these challenges is the issue of achieving sustainable food security, which in turn requires good management of the country's natural resources; to achieve increases in the national (local) agricultural production and to meet the needs of the growing population for both plant and animal agricultural products **(Mhaibes & Al-Taiy, 2019); (Mohammed, 2016)**.

So, in order to achieve this increase in plant and animal production, it is necessary to develop strategic plans that aim to achieve behavioral changes in the target audience, as well as adopting the use of modern agricultural technologies in various fields of agricultural production, which in turn, can be achieved by investing in agricultural extension efforts. Accordingly, using the efforts of the Agricultural Extension Agency, as one of the development agencies in the agricultural sector, will achieve the desired increase in agricultural production, and that will be done through the agricultural extension services which provide the target audience, including: transferring modern agricultural technology, agricultural training,

developing skills, correcting knowledge, and improving attitudes **(Najris & Arsan, 2023); (Ajayi & Fapojuwo, 2014); (Kaegi, 2015)**.

Despite the importance of the Agricultural Extension Service role in agricultural work, the reality indicates that agricultural extension services in general, and the central administration for Agricultural Extension in Iraq in particular, are facing many criticisms at the present time, because of the poor effectiveness and efficiency in transferring and disseminating agricultural information, technical recommendations and agricultural innovations, as well as the poor sustainability of the solutions which provided by the Agricultural Extension Authority **(Al-Ajili & Novan,2019)**.

In fact, these criticisms are considering as a result of the many problems that the agricultural extension organization suffers from, including: limited training for agricultural extension agents in general, poor communication between them and the target audience, decrease in the number of agricultural extension agents compared to the numbers of the target audience, and lack of funding, which has led to a gradual reduction in public agricultural extension services over the past decades (**Bhattacharjee & Raj, 2016**); (**Al-Hafidh & Al-Taiy, 2022)**. As well as the difficulty of dealing with the target audience who disparity in terms of culture, experience, awareness, etc., which has made agricultural extension agents use various methods and means when providing agricultural extension services to confront this problem (**Al-Mashhadani, 2013**). On the other hand, it is noted that the agricultural extension departments suffer from a lack of good qualifications for agricultural extension agents that enable them to keep abreast of developments in the use of modern digital information and communication technology (**Jassim & Jumaili, 2021**).

Accordingly, all of the above represents great pressure on agricultural extension organization and its workers, which can be overcome by following right and successful steps in developing agricultural extension work, and at forefront of these steps is work to support traditional agricultural extension methods and means, by providing agricultural extension services using information and communications technology or what is known as digital agricultural extension (**Bhattacharjee & Raj, 2016**); (**Al-Hafidh & Al-Taiy, 2022)**. As the traditional methods alone are no longer feasible or appropriate in providing, analyzing and transferring data and information, whether to the target audience or to decision makers alike, so it is necessary to introduce modern technology in dealing with data and information, and the gradual transformation into digital organizations instead of routine work **(Al, Awadi,2019)**.

The world today is witnessing a great revolution in communication and information systems as a result of technological developments in various fields, which can be used by agricultural extension agents in providing agricultural extension services (**Al-shamry, 2021**). Since digital applications have become modern methods of communication, which can be employed and used in the activities of various organizations (including agricultural extension organizations) and service their audiences from inside or outside the organization **(Shubar & Zidane, 2021); (Al-Heali, 2022).** Thus, digital applications these days are able to arouse or urge interest and obtain feedback on the information, technologies and expertise which provided by the organization, and obtain the behavioral changes that organizations aspire to achieve in general **(Ismael, 2021).** Therefore, modern digital applications can contribute to supporting the desired agricultural development in various agricultural organizations, including the Agricultural Extension Organization **(Najris & Arsan, 2023).**

The agricultural extension organization, in turn, depends on many factors to achieve effectively its goals, the most important of which is the performance of the agricultural extension agents who are working as a link or bridge between the extension organization and the target audience, and at the present time they have the task of using modern digital extension methods and means (as well as traditional extension methods and means) to deal with the huge and diverse amount of renewable and constantly evolving agricultural information and technologies in the field of the agricultural sector, as well as to benefit from them in providing extension services to the target audience **(Al-Lazzawy & Al-mashadany, 2017); (Najris & Arsan, 2023);** (**Al-Salihi, 2016**).

Despite the importance of digital agricultural extension in improving the effectiveness and efficiency of the level of agricultural extension services, but unfortunately, it is not without problems that may hinder the continuity of its work or prevent its full use (**Suleiman, Siddiq, & Mohsen, 2018**). Therefore, not knowing, analyzing, diagnosing, and confronting these problems that may face agricultural extension agents when using digital agricultural extension, may lead to their transformation into a threat that hinders or fails the entire process (**Ahmadpour & Mirdamadi, 2010**); (**Dharmawan *et al.*, 2021**).

Based on the foregoing, and as a result of the lack of Iraqi studies that show the extent of the problems as well as the diagnosis of their impact, which may hinder or prevent the use of digital agricultural extension in providing agricultural extension services, this current research came to answer the following research question:

_ What are the problems of using digital agricultural extension in providing agricultural extension services from the viewpoint of agricultural extension agents?

Research Aims

The research has aimed to determine the problems in the use of digital agricultural extension, as well as indicating the extent of their impact from the viewpoint of agricultural extension agents, as follows:

1. The administrative and financial problems and its impact.
2. The technical and human problems and its impact.

Research Hypothesis

The process of identifying the problems facing the use of digital agricultural extension in the process of providing the agricultural extension service will reveal in the existence of many problems with big impact, which must be resolved and overcome in a manner that ensures the achievement of the highest effectiveness and efficiency when using digital agricultural extension in the present and future.

Research Importance

The importance of the research is related to the necessary need to provide officials (or decision makers) in the Iraqi Ministry of Agriculture and the Agricultural Extension and Training Department with potential administrative, financial, human and technical problems, as well as an indication of their impact; which may hinder the process of using digital agricultural extension in providing the agricultural extension service to the target audience or threaten the success of the entire process, so, identifying these problems and indicating the extent of their impact will help officials to work on their part to solve these problems and overcome them in a way that guarantees the investment of efforts, times, funds and the available resources in an optimal manner, as well as guarantees the continuous using of digital agricultural extension in

providing the agricultural extension service to the target audience with the highest possible effectiveness and efficiency.

MATERIALS AND METHODS

Research Methodology

The research mainly aimed at identifying the problems of using digital agricultural extension in providing the agricultural extension service and indicating the extent of its impact from the viewpoint of agricultural extension agents; accordingly, the appropriate research approach is the descriptive approach, and the most appropriate research method of this approach is the analytical diagnostic method, which was adopted in the research to achieve accurate diagnosis and objective identification of the problems and their impact in using of digital agricultural extension, and then interpret results in light of possible reasons. This type of research has proven its effectiveness in many areas, including political, economic, social and others, by using data collection methods and interpreting information through questionnaires and personal interviews **(Kandilji,2008).**

Research Population and Sample:

The research population included all agricultural extension agents (agricultural extension agents service providers) who were existed in the Agricultural Extension and Training Department, the Extension Training and Rehabilitation Center, and the Agricultural Extension Center for Training, in addition to Agricultural Extension Farms in Baghdad governorate, thus, research population included (100) agricultural extension agents (from male and female), as shown in Table (1).

Table (1): distribution of agricultural extension agents (of both sexes) according to their Places.

Research Population	Research Area	Number
Agricultural Extension Agents	Agricultural Extension and Training Department	٨٠
	Training and Rehabilitation Center	٤
	Agricultural Extension Center for Training	٦
	Agricultural Extension Farm in Al-Tarmiya	٥
	Agricultural Extension Farm in Al-Rashidiya	٥
Total		١٠٠

Then, a random sample took from research population which consist of (83%) from the five agricultural extension places, so, the random sample has included (83) agricultural extension agents (from male and female) which used to carry out research and achieve its aims.

Research Tool

In order to build a measure to determine the problems of use digital agricultural extension from the viewpoint of agricultural extension agents, dependence has been made on a group of scientific sources specialized in agricultural extension, as well as scientific sources related to computers and information technology, in addition to the opinions of a group of experts specialized in agricultural extension in the College of Agricultural Engineering Sciences \ University of Baghdad, as well as experts specialized in computer and information technology who work in the Iraqi Ministry of Agriculture. Hence, two axes were identified for

the research in order to identify the problems of using digital agricultural extension from the viewpoint of the agricultural extension agents, which were measured by asking them (from male and female) about the extent of his/her agreement or disagreement with the paragraphs constituting the two axes, which namely: administrative and financial problems (7) paragraphs and technical and human problems (11) paragraphs; and this was done by identifying the existence or not existence of the problem by using the phrases (yes, no) and assigning degrees (0,1), respectively, and then identifying the extent of the problem impact (if it exists) using the phrases (low, medium, big) and assigning them with degrees (3, 2, 1), respectively.

Questionnaire Validity and Reliability:

The method of content validity and face validity **(Bhattacherjee, 2012)** was used to measure the validity of the questionnaire by presenting the questionnaire (in its initial form) to (10) arbitrators (judges) from faculty members at the University of Baghdad / College of Agricultural Engineering Sciences / Department of Agricultural Extension and Technology Transfer, as well as arbitrators in the field of computer and digital applications, then the necessary modifications were made to the questionnaire, and after completing the questionnaire in its final form, a Pre-Test was conducted in October of the year (2022) using the final questionnaire on a random sample consisting of (12) agricultural extension agents from the Agricultural Extension and Training Department, the Training and Rehabilitation Center, and the Agricultural Extension Center for Training[1]. The purpose of the Pre-Test was to verify the consistency (reliability) and stability of the results, as well as to reveal the validity of the content and the extent of clarity and distinction of the paragraphs in the questionnaire, then Cronbach's Alpha (α) equation was used to examine the reliability of the results because it is suitable for obtaining a stability coefficient from the data set for a graduated scale of expressions[2] and this method is characterized by being short in effort and avoiding the effect of transferring the effect of training or avoiding an effect of remembering and trying to avoid some of the previous answers, all of which are disabled features in the Retest method for example **(Sami,1999)**. Thus, the results showed that the coefficient of reliability was high for the two axes of problems of use digital agricultural extension, which ranged between (0.791) as a minimum and between (0.888) as a maximum, so, this indicates that the questionnaire has a high degree of reliability, and it can be relied upon in field application to achieve the objectives of the research. This is according to the Nunnally & Bernstein scale, which adopted (0.7) as a minimum for reliability **(Nunnally & Bernstein, 1994)**. Then, Pearson Linear Correlation Coefficient was used to examine the validity of the internal consistency between each paragraph of the axis and the total score of the same axis. The results showed that all Pearson's correlation coefficients between the axis' paragraphs and the total score of the axis were statistically significant at a significant level (0.01) and (0.05), where the minimum for the correlation coefficients was (0.582), while the upper limit was (0.886), accordingly, all the paragraphs of each axis were internally consistent with the axis to which they belong, which proves the validity of the internal consistency of the axes and paragraphs of each axis.

[1]. Pretest participants were excluded from the final data collection process.

[2]. The same applies to the split-half method or the Guttman method, which gives almost the same results.

Data Collection:

After completing all stages of the process of preparing and developing the questionnaire, the researcher proceeded with the process of collecting data, and the data was collected in the questionnaire through a personal interview with the agricultural extension agents (from male and female), as well as communication and follow-up with them using social media to answer questions about the nature and objectives of the research or questionnaire, so, the data collection process took about two months, which extended from 1/11/2022 to 29/12/2022, noting that all the questionnaires were obtained from the agricultural extension agents (the research sample).

Statistical Processors:

Appropriate statistical methods were used to achieve the aims of the research, which are weighted average, numbers and percentages, simple linear correlation law (Person), Cronbach's alpha coefficient, and (Steven K. Thompson) equation to determine the required sample size from the target population.

RESULTS AND DISCUSSION

This part deals with a presentation of the determining of the problems existence as well as an indication of the extent of their impact on the use of digital agricultural extension in providing the agricultural extension service, as follows:

1. Administrative and Financial Problems:

The research results have shown that the answers of the agricultural extension agents have been somewhat similar in determining the existence of administrative and financial problems that related to the use of digital agricultural extension, so, the problem of (difficulty of following up the target audience and correcting their levels (including the process of measurement and evaluation) during and after doing digital educational activities, due to the small number of agricultural extension agents compared to the huge number of target audience) has ranked first in terms of the existence, and the problem of (weak encouragement and interest by the central administration about the use of digital agricultural extension in providing extension services) has ranked in the last place of existence, also the results have shown that the overall average effect of this axis has reached (2.41) degrees, which has described as a big (or high) effect on the process of using digital agricultural extension, as shown in table (2).

Table (2): Distribution of agricultural extension agents according to their answers about administrative and financial problems.

NO.	Administrative and Financial Problems	Freq. & Perc.	Problem Existence		Freq. & Perc.	Problem Effect			Weighted Average	Rank
			No	Yes		Low	Medium	High		
1.	Lack of symposiums, lectures and training courses for agricultural extension agents in the use of digital agricultural extension.	Freq.	11	72	83	8	21	43	2.49	2
		%	13.3	86.7	100	9.6	25.3	51.8		
2.	Poor coordination between research centers and agricultural extension departments on the one hand, and between relevant organizations such as colleges of agriculture, agricultural associations, and civil society organizations to provide the available digital agricultural extension websites with priority agricultural information that needed by the target audience.	Freq.	12	71	83	12	21	38	2.37	5
		%	14.5	85.5	100	14.5	25.3	45.8		
3.	Weak and insufficient funding to train agricultural extension agents to use digital extension in providing extension services.	Freq.	6	77	83	14	22	41	2.35	6
		%	7.2	92.8	100	16.9	26.5	49.4		
4.	Difficulty of following up the target audience and correcting their levels (including the process of measurement and evaluation) during and after doing digital educational activities, due to the small number of agricultural extension agents compared to the huge number of target audience	Freq.	4	79	83	8	32	39	2.39	4
		%	4.8	95.2	100	9.6	38.6	47.0		
5.	The weakness of the integrated infrastructure of the agricultural extension departments, including halls, equipment, electronic platforms, digital applications, and high-quality Internet services.	Freq.	7	76	83	7	25	44	2.49	2
		%	8.4	91.6	100	8.4	30.1	53.0		
6.	Absence of funding allocated for the purchase of digital devices and applications, and the establishment and design of extension platforms or websites to provide digital extension service.	Freq.	7	76	83	6	27	43	2.49	2
		%	8.4	91.6	100	7.2	32.5	51.8		
7.	Weak encouragement and interest by the central administration about the use of digital agricultural extension in providing extension services.	Freq.	14	69	83	12	25	32	2.29	7
		%	16.9	83.1	100	14.5	30.1	38.6		
Overall Average Effect = 2.41 **Low Effect (1 – 1.66), Medium Effect (1.67 – 2.33), High Effect (2.34 - 3)**										

Also, it can be concluded from the above table that the most administrative and financial problems affecting the use of digital agricultural extension in providing agricultural extension services from the viewpoint of agricultural extension agents were the problem of (Lack of symposiums, lectures and training courses for agricultural extension agents in the use

of digital agricultural extension), and the problem (The weakness of the integrated infrastructure of the agricultural extension departments, including halls, equipment, electronic platforms, digital applications, and high-quality Internet services), as well as the problem (Absence of funding allocated for the purchase of digital devices and applications, and the establishment and design of extension platforms or websites to provide digital extension service), with a weighted average of (2.49) degrees, so, this may be attributed to the presence of great awareness among agricultural extension agents about the seriousness of these problems and their direct impact on the success or failure of using digital agricultural extension in providing extension service.

In addition, the problem (Weak encouragement and interest by the central administration about the use of digital agricultural extension in providing extension services), came in the last place in terms of impact, with a weighted average of (2.29) degrees, and this may lead to the reluctance (unwillingness) of agricultural extension agents to use digital agricultural extension, or it may cause a total or partial suspension of digital agricultural extension activities when applied in the future, especially if the matter is stemming (originated in) from the conviction and certainty of central administration officials (from the beginning) of the futility or uselessness of digital agricultural extension in providing the agricultural extension service.

Thus, based on the above, the matter requires serious action and hard work to overcome all the administrative and financial problems that the research results have shown their existence and direct impact; this is to ensure the highest effectiveness and efficiency in the use of digital agricultural extension in the providing the agricultural extension services.

2. Technical and Human Problems:

The research results have shown that the answers of the agricultural extension agents have been somewhat similar in determining the existence of technical and human problems that related to the use of digital agricultural extension, so, the problem of (The spread of illiteracy in its general sense (the inability to read and write) among the target audience, as well as electronic illiteracy (the inability to use and deal with electronic devices)) has ranked first in terms of the existence, and the problem of (The difficulty of providing and achieving security and digital data protection for participants in digital agricultural extension) has ranked in the last place of existence, also the results have shown that the overall average effect of this axis has reached (2.32) degrees, which has almost described as a big (or high) effect on the process of using digital agricultural extension, as shown in table (3).

Table (3): Distribution of agricultural extension agents according to their answers about technical and human problems.

NO.	Technical and Human Problems	Freq. & Perc.	Problem Existence		Freq. & Perc.	Problem Effect			Weighted Average	Rank
			No	Yes		Low	Medium	High		
1.	The difficulty of providing and achieving security and digital data protection for participants in digital agricultural extension	Freq.	16	67	83	15	25	27	2.18	10
		%	19.3	80.7	100	18.1	30.1	32.5		
2.	Some agricultural extension agents are not convinced of the using the digital applications for fear of reducing their role in the field extension process, and transfer or decline of their role in designing and following up electronic extension programs.	Freq.	12	71	83	16	28	27	2.15	11
		%	14.5	85.5	100	19.3	33.7	32.5		
3.	Weakness in the direct interaction between the agricultural extension agents and the target audience during the implementation of some counseling activities.	Freq.	7	76	83	14	27	35	2.28	7
		%	8.4	91.6	100	16.9	32.5	42.2		
4.	Limited availability of a culture of participation, discussion and constructive criticism among the users of digital agricultural extension, which must be far from attacking or offending others.	Freq.	8	75	83	12	31	32	2.27	8
		%	9.6	90.4	100	14.5	37.3	38.6		
5.	Some members of the rural community consider digital agricultural extension as less efficient than traditional agricultural extension.	Freq.	7	76	83	12	23	41	2.38	3.5
		%	8.4	91.6	100	14.5	27.7	49.4		
6.	The widening gap between the digital knowledge and skill required to use digital agricultural extension, and between the traditional knowledge and skill that most agricultural extension agents have it.	Freq.	9	74	83	8	33	33	2.34	5
		%	10.8	89.2	100	9.6	39.8	39.8		
7.	Weakness or limited possibility of covering all plant and animal topics at the beginning of using digital extension, especially those that need application and performance evaluation.	Freq.	9	74	83	11	33	30	2.26	9
		%	10.8	89.2	100	13.3	39.8	36.1		
8.	Lack of information that explaining the mechanisms of operation or use the digital agricultural extension applications by the target audience.	Freq.	9	74	83	8	30	36	2.38	3.5
		%	10.8	89.2	100	9.6	36.1	43.4		

NO.	Technical and Human Problems	Freq. & Perc.	Problem Existence		Freq. & Perc.	Problem Effect			Weighted Average	Rank
			No	Yes		Low	Medium	High		
9.	Speed and magnitude of change in information and communication technology, and the difficulty of keeping pace (pro-cyclical) with it according to the available financial, material and human resources.	Freq.	9	74	83	7	27	40	2.45	2
		%	10.8	89.2	100	8.4	32.5	48.2		
10.	Some agricultural extension agents fear accountability (questioning) when errors or malfunctions occur in the devices used in digital agricultural extension.	Freq.	10	73	83	8	33	32	2.33	6
		%	12.0	88.0	100	9.6	39.8	38.6		
11.	The spread of illiteracy in its general sense (the inability to read and write) among the target audience, as well as electronic illiteracy (the inability to use and deal with electronic devices)	Freq.	2	81	83	7	28	46	٢,٤٨	1
		%	2.4	97.6	100	8.4	33.7	55.4		
Overall Average Effect = 2.32 Low Effect (1 – 1.66), Medium Effect (1.67 – 2.33), High Effect (2.34 - 3)										

Following the above table, it can be concluded that the most technical and human problems affecting the use of digital agricultural extension in providing agricultural extension services from the viewpoint of agricultural extension agents was the problem of (The spread of illiteracy in its general sense (the inability to read and write) among the target audience, as well as electronic illiteracy (the inability to use and deal with electronic devices)), with a weighted average of (2.48) degrees, so, this may be due to the presence of great awareness among agricultural extension agents of the great impact of this problem, which may threaten and hinder the use of digital agricultural extension. If some of the target audiences are unable to deal with electronic platforms or applications, this will undoubtedly threaten the spread of the use of digital agricultural extension, and will negatively affect its level of success.

In addition, the problem (Some agricultural extension agents are not convinced of the using the digital applications for fear of reducing their role in the field extension process, and transfer or decline of their role in designing and following up electronic extension programs), came in the last place in terms of impact, with a weighted average of (2.15) degrees, and this may show the need to educate some agricultural extension agents that the use of digital agricultural extension is a complementary and supportive means to other agricultural extension methods and means, and it's not a substitute for it.

Hence, based on the foregoing, the matter requires a serious action and hard work to overcome all the technical and human problems that the research results have shown their existence and direct impact; this is to ensure the continuity and sustainability of the use of digital agricultural extension in the providing the extension services, and to achieve the feasibility and desired goals behind its use.

CONCLUSIONS

Based on the research results that have been reached, the following are concluded:

1. The research results have shown that the answers of the agricultural extension agents were somewhat similar in determining the existence of administrative and financial problems related to the use of digital agricultural extension, which are described as having a significant impact on the process of using digital agricultural extension in the provision of agricultural extension service.
2. The research results have shown that the highest administrative and financial problems affecting the use of digital agricultural extension were the problem of (Lack of symposiums, lectures and training courses for agricultural extension agents in the use of digital agricultural extension), and the problem (The weakness of the integrated infrastructure of the agricultural extension departments, including halls, equipment, electronic platforms, digital applications, and high-quality Internet services), as well as the problem (Absence of funding allocated for the purchase of digital devices and applications, and the establishment and design of extension platforms or websites to provide digital extension service).
3. The research results have shown that the answers of the agricultural extension agents were somewhat similar in determining the existence of technical and human problems related to the use of digital agricultural extension, which are described as having a significant impact on the process of using digital agricultural extension in the provision of agricultural extension service.
4. The research results have shown that the highest technical and human problems affecting the use of digital agricultural extension was (The spread of illiteracy in its general sense (the inability to read and write) among the target audience, as well as electronic illiteracy (the inability to use and deal with electronic devices)).

RECOMMENDATIONS

1. The need for the Ministry of Agriculture to provide the necessary financial allocations for the implementation of symposium, lectures and training courses for agricultural extension agents in the field of using digital agricultural extension, which is also necessary to provide hardware devices, digital software applications and other infrastructure necessary to provide digital agricultural extension service, and enables the Agricultural Extension and Training Department and its affiliated departments to perform their work with the highest possible quality, in addition to solving problems that they may face in the future.
2. The Agricultural Extension and Training Department must provide a group of agricultural extension agents who are able to implement digital educational activities; and this is done either by hiring people with experience and skill in the field of information and communication technology in addition to experience in the field of agricultural extension, or by implementing training courses for agricultural extension agents in agricultural departments (especially young ones) on the use of digital applications in providing agricultural extension services to the target audience.
3. The Agricultural Extension and Training Department must carry out educational campaigns targeting mainly rural youth (male and female) to encourage and urge them to use digital applications facilely and easily, and to benefit from the agricultural extension

services provided by the Agricultural Extension Departments, thus, these young people, in turn, encourage, edification, and educate their families and neighbors, as well as the rest of their community, to use and benefit from digital applications.

4. The Ministry of Agriculture must (as a first step) create a digital application that includes agricultural information, agricultural experiences, as well as the possibility of obtaining electronic agricultural consultations by the target audience, then assess the benefit achieved and the problems that may appear and find appropriate solutions to them, and after that (and as a second step) starting to create an integrated electronic platform that provides all agricultural extension services to the target audience.
5. The Ministry of Agriculture should work on solve all other problems which have indicated by the results of the research in some detail in terms of existence or impact; This is by solving it directly through the departments of the Ministry of Agriculture or in coordination and cooperation with other relevant ministries, to guarantees achieving the highest efficiency and effectiveness in the process of using digital agricultural extension in providing agricultural extension service to the target audience.

REFERENCE

1. Ahmadi, A., Ansyor, A., Suharyanto, S., & Hidayat, Z. (2021). Effectiveness of Digital-Based Agricultural Extension Implementation in Central Bangka Regency. *E3S Web of Conferences*, 1 – 7.
2. Ahmadpour, A., & Mirdamadi, M. (2010). Determining challenges in the application of e-learning in agricultural extension services in Iran. *American-Eurasian Journal of Agriculture and Environmental Science*, 9(3), 292-296.
3. Ajayi, M. T., & Fapojuwo, O. E. (2014). Capacity Building of Extension Agents for Sustainable Dissemination of Agricultural Information and Technologies in Developing Countries. *International Journal of Agricultural and Biosystems Engineering*, 8(7), 2297-2299.
4. Al-Ajili, S. A., & Bashar N. N., (2019). "The extent of mobile phone use in extension work by agricultural extension workers in Salah al-Din Governorate", *Kirkuk University Journal of Agricultural Sciences, (special Issue), 85 – 93.*
5. Al-Awadi, Z. I. M., (2019), *Evaluation the Employment of Informatics in Agricultural Extension to achieve Sustainable Rural Development in Babil Governorate – Iraq,* PhD Dissertation, *Sudan University of Science and Technology, College of Graduate Studies*, 1 – 237.
6. Al-Hafidh, F. S., & Al-Taiy, H. (2022). Suggested visualization for some quality elements of extension service for vegetable farmers from their viewpoint in the governorate of baghdad. *Iraqi Journal of Agricultural Sciences*, 53(5), 1203-1211.
7. Al-Heali, A. (2022). The Role of Electronic Marketing in promoting the products of the national industry in Iraq: the role of electronic marketing in promoting the products of the national industry in Iraq. *Iraqi Journal of Market Research and Consumer Protection*, 14(1), 1-14.
8. Al-Lazzawy, N. S. H., & Al-mashadany, M. (2017). The role of specialized training courses in improving the performance of workers in the field of livestock in the

governorates of the central region of Iraq, *Iraqi Journal of Agricultural Sciences*, 48(3), 874 – 884 .

9. Al-Mashhadani, A. L. J. (2013). Using" Extension Means" In Process of Dissemination of Agricultural Technologies from Viewpoint of Agricultural Extension Workers and Relationship with Some Related Factors. *Iraqi Agricultural Sciences Journal*, ٤٢(٥), 80-97.
10. Al-Salhi, A. T. H., (2016). "Communicative Characteristics of the Extension System and its Relationship to Wheat Growers' Application of Agricultural Recommendations in Kirkuk Governorate." *Iraqi Journal of Agricultural Sciences* 1(7), 351 – 357.
11. Al-shamry, M. F. H., (2021). The means and methods of communication for the Municipality of Baghdad and the municipalities during the operations of imposing the law, Journal of Al-Bahith Al-A'alami, (54) 19 : 7–22.
12. Bhattacharjee, S., & Raj, S. (2016). Social media: Shaping the future of agricultural extension and advisory services. *Global Forum for rural Advisory Services (GFRAS)*, Lindau, Switzerland, 9, 1-13.
13. Bhattacherjee, A. (2012). *Social Science Research: Principles, Methods, and Practices*. 1 - 149.
14. Dharmawan, L., Muljono, P., Hapsari, D. R., & Purwanto, B. P. (2021). Digital information development in agriculture extension in facing new normal era during COVID-19 pandemics. *Journal of Hunan University Natural Sciences*, 47(12), 65-73.
15. Ismael, B. J. (2021). Applications of social networking sites: Research Tools, *Journal of AL-Bahith AL-A'alami*, 13(53), 107-111.
16. Jassim, H. N., and Mahmoud Hadis Al Jumaili. (2021). "The Importance of Electronic Agricultural Extension from the Point of View of Agricultural Extension Workers in the Center of Kirkuk Governorate". *Kirkuk University Journal of Agricultural Sciences*, 12(2): 42–53.
17. Kaegi, S. (2015). The experiences of India's agricultural extension system in reaching a large number of farmers with rural advisory services. *Background paper for Workshop Reaching the Millions at Hanoi*, Vietnam,1-25.
18. Kandilji, A. I., (2008), scientific research and the use of traditional and electronic sources of information, Dar Al-Yazuri for publishing and distribution.131-133.
19. Mhaibes, I. J., & Al-Taiy, H. K. (2019). Proposals for improving the agricultural innovation system (ais) performance in the field of developing barley cultivation in iraq from agricultural researchers point of view. *Journal of Plant Archives*, 19(2), 3097-3105.
20. Mohammed, A. J. (2016). Food problem in Iraq: Challenges and Antiquities. College of Administration and Economics, University of Baghdad, *Iraq journal of market research and consumer protection*, 8(1). 205-230.
21. Najris, T. K. M., & Arsan, A. Y. (2023). The Role of Digital Technologies of Public Relations Programs in Supporting Agricultural Development: A Survey Study of the Iraqi Ministry of Agriculture. *Social Science Journal*, 13(1), 2484-2502.
22. Nunnally J. C., & Bernstein I. H., (1994). *Psychometric Theory*, 3rd edn, McGrawHill: New York. NY, USA. 701.

23. Shubbar, M. A., and Nahed F. Z., 2021. "The Employment of Electronic Public Commentators in the Martyrs Foundation and the Electronic Communication Means Used in Their Activities via the Internet (A Survey Study of a Sample of the Iraqi Public". *Journal of Scientific Researcher*, appendix to Issue (54): 23–38.
24. Suleiman, M. S., Abu Bakr A. S., and Zulfiqar I. M. 2018. "Obstacles to the Employment of ICT in Agricultural Extension from the Perspective of Workers in the Field of Extension Work in Babylon Governorate, Republic of Iraq." *Journal of Humanities*, 19 (4), 333 – 351.
25. Sami Areefej, Scientific Research Methods and Methods, 2nd Edition, Dar Majdalawi, Amman, 1999, 1-١٤٥.