



## Assessing the Level of Skills of Agricultural Extension Workers in the Field of Disseminating Agricultural Technologies in Iraq

Hussein Eisa Khaiaf Al-Bakat<sup>1</sup>, Jalal Hameed Ali<sup>2\*</sup>

<sup>1</sup>Ministry of Agriculture- Department of Agriculture- Extension and Training- Counseling Center in Wasit

<sup>2</sup>Soil sciences and water resources Dep. / College of Agriculture/ University of Sumer/ Thi Qar Al-Refai / Iraq

Email: [hu.irshaad@gmail.com](mailto:hu.irshaad@gmail.com) & \* Email: [jalahameed75@gmail.com](mailto:jalahameed75@gmail.com)

### Abstract

The research aimed to assess the level of skills of agricultural extension workers in the field of disseminating agricultural technologies in Iraq and determine the relative importance of each field of agricultural technology dissemination. To achieve the research objectives, data was collected through a questionnaire administered via personal interviews with a random sample of workers in counseling centers. The sample consisted of 250 respondents, representing 35% of the total study population of 710 respondents. Frequencies, percentages, Pearson's correlation coefficient, and Step-Wise multiple regression analysis were used to analyze the research data. The results indicated a low level of skills among agricultural extension workers in the field of disseminating agricultural technologies. The highest category of respondents fell within the low category, accounting for 55.6%. The field of agricultural systems ranked first in terms of relative importance (53.36%), while the field of evaluation ranked last with a relative importance of 42.28%. The study recommends that the Iraqi Ministry of Agriculture enhance the capabilities and skills of agricultural extension workers in the field of disseminating agricultural technologies through increasing training courses and keeping the workers informed about the latest developments in agricultural technology dissemination.

**Keywords:** Agricultural extension; Workers capabilities; Agricultural technology; Training courses

## التعرف على مستوى قدرات العاملين في الإرشاد الزراعي في مجال نشر التقانات الزراعية في العراق

حسين عيسى خلف البخاتي<sup>1</sup>، جلال حميد علي<sup>2</sup>

<sup>1</sup> وزارة الزراعة، دائرة الإرشاد والتدريب الزراعي، المركز الإرشادي في واسط

<sup>2</sup> قسم علوم التربة والموارد المائية، كلية الزراعة، جامعة سومر، ذي قار، العراق

### الخلاصة

استهدف البحث التعرف على مستوى قدرات العاملين في الإرشاد الزراعي في مجال نشر التقانات الزراعية في العراق، وتحديد الأهمية النسبية لكل مجال من مجالات نشر التقانات الزراعية. ولتحقيق أهداف البحث تم جمع البيانات عن طريق الاستبيان بالمقابلة الشخصية لعينة عشوائية من العاملين في المراكز الإرشادية وبلغ قوامها (250) مبحوث بما يمثل (35%) من إجمالي شاملة الدراسة والبالغ عددهم (710) مبحوث، وتم استخدام التكرارات والنسب المئوية، ومعامل الارتباط البسيط لبيرسون، وأسلوب تحليل الانحدار المتعدد المتدرج-Step-Wise لتحليل بيانات البحث. وأشارت النتائج إلى انخفاض قدرات العاملين في الإرشاد الزراعي في مجال نشر التقانات الزراعية إذ تبين إن أعلى فئة للمبحوثين كانت ضمن الفئة المنخفضة بنسبة (55.6%)، وجاء مجال النظم الزراعية بالمرتبة الأولى بأهمية نسبية (53.36%)، وجاء مجال التقييم بالمرتبة الأخيرة بأهمية نسبية (42.28%). يوصي البحث بقيام وزارة الزراعة العراقية بتطوير قدرات ومهارات العاملين في مجال نشر التقانات الزراعية من خلال زيادة الدورات التدريبية والعمل على إطلاع العاملين على ما هو جديد في مجال نشر التقانات الزراعية.

**الكلمات المفتاحية:** دائرة الإرشاد، قدرة العاملين، التقانة الزراعية، الدورات الزراعية



## 1. Introduction

The agricultural extension institution plays important and multiple roles, including the transfer of agricultural research findings, guidance, and scientific recommendations to farmers, convincing and training them to adopt modern agricultural methods and ideas, and implementing them practically. The successful dissemination and delivery of agricultural technologies to farmers require a comprehensive and scientific understanding by agricultural extension workers of both the concept of technologies in general and agricultural technologies specifically, as well as the methods of disseminating them to the target audience and integrating them into their farming systems [1].

The success of the agricultural extension institution in performing its mission effectively and achieving its desired goals largely depends on the efficiency, skill, ability, and experience of agricultural extension workers. The nature of extension work requires those involved to have a comprehensive and up-to-date understanding of all advancements in agricultural sciences and research [2]. As a result, it is necessary to develop the capabilities and skills of agricultural extension agents so that this extension organization can effectively fulfill its role in providing advisory services, particularly in the field of disseminating agricultural technologies, and reaching the largest possible number of rural communities. In order to enhance the capabilities of agricultural extension workers in the field of disseminating agricultural technologies, based on scientific principles and standards, it is important to assess their level of skills. This assessment will help in designing targeted advisory programs and plans aimed at improving these advisory capabilities.

In light of the aforementioned research problem, the research objectives were identified as follows:

1. To determine the level of skills of agricultural extension workers in the field of disseminating agricultural technologies.
2. To determine the relative importance of each field within the domain of agricultural technology dissemination.

## 2. Literature Review:

### 2.1 Concept of Capabilities:

Capacities have been defined by several definitions. Salem defined them as the ability to perform a specific task, whether it is a physical or mental activity. It refers to what an individual can actually accomplish, including speed and accuracy in performance. There is no distinction in this usage between acquired capabilities and innate capabilities [3]. In contrast, Viengxay defined capabilities as tools used by all departments to enhance the potential and capabilities of employees within an organization through a range of activities such as workshops, meetings, field visits, monitoring, and others [4].

There are several factors that influence an individual's possession of capabilities in various aspects of life, and these factors can be either acquired or innate. Among these factors is genetics, which plays a significant role in influencing the abilities of individuals. Researchers have indicated through a range of studies and scientific research that genetics have an impact on determining the level of mental and physical capabilities of individuals, as well as the



diverse traits of personality, and they also contribute to the differentiation of cognitive and motor differences among individuals.

### 2.2 Family and Social Environment:

Many researchers attach great importance to the environmental and social conditions surrounding an individual, whether from an economic or social perspective. It is considered a decisive and important factor in acquiring the capabilities required for performing a specific task or a particular skill.

### 2.3 Age:

The age of an individual reflects the extent of life and work experiences they have gone through, and therefore, it influences the level of capabilities they possess. Experiences serve as a renewable source that individuals use in the face of challenging situations they encounter [3].

The achievement of the desired goals of the Agricultural Guidance Device depends on the capabilities possessed by the agricultural advisors at various levels of their administrative and technical positions. These capabilities enable them to perform their tasks in the most complete and optimal manner. These abilities vary from one advisor to another, according to several factors, which can be divided into two main groups [5]:

1. Inherited factors: These are the individual characteristics and traits that the advisor possesses. These factors can include personal qualities, attitudes, and aptitudes that contribute to their effectiveness in their role.

2. Skills and abilities acquired through education and training: These are the capabilities and skills that the advisor acquires during their initial education stages, as well as through training courses while performing their advisory duties.

The importance of institutional capabilities is highlighted as a means to enhance the knowledge and potential of agricultural workers within the organization. They contribute to the development of managerial, organizational, and technical skills, as well as the establishment of effective relationships within the community. These capabilities also ensure the continuity of service provision and developmental projects [6].

Agricultural technologies are defined in multiple ways. Ali defined them as organized efforts to apply scientific research results, including mechanical, chemical, biological, and other aspects, in the field of agricultural production. These technologies aim to improve and develop the agricultural sector as a whole [7]. Fargel defined agricultural technologies as advanced devices, equipment, and tools owned by rural individuals in various aspects of their domestic, agricultural, and service lives. These technologies contribute to reducing effort and time expended, while enhancing their quality of life, prosperity, and well-being [8].

The success of agricultural technology dissemination primarily depends on a set of factors, including [9]:

1. Scientific research: This encompasses scientific research centers, universities, and scientific and technological planning. It involves giving significant importance to scientific planning and developing plans that determine methods and approaches for disseminating agricultural technologies that align with social, environmental, and available resource



conditions. It also involves prioritizing the formation of a core group of specialized scientists, researchers, technicians, and agricultural engineers to handle agricultural technologies, understand them, and work towards expanding the scope of scientific dissemination between farmers and information centers.

2. Training and capacity building: Emphasis is placed on training and preparing individuals to effectively deal with agricultural technologies. This involves equipping scientists, researchers, technicians, and agricultural engineers with the necessary knowledge and skills to understand, adopt, and disseminate agricultural technologies. It also involves expanding the reach of scientific dissemination through agricultural extension services and information centers, which serve as crucial channels for accessing modern agricultural scientific and technological information.

### **3. Research Methodology:**

#### *3.1 Study Methodology*

The current study relied on the use of the descriptive-analytical methodology, through which the researcher attempts to describe the phenomenon under study. It also aims to identify the relationship between its components, the opinions expressed about it, the processes involved, and the potential effects that can occur. This methodology is considered suitable for obtaining detailed and comprehensive data and facts about the subjects being researched within a specific timeframe [10]. And I used the analytical method to process the quantitative data collected from the research population, in order to conduct statistical analysis of the study sample.

#### *3.2 Study Domains:*

##### 1. Geographic Scope of the Study Sample:

To assess the level of agricultural extension workers' capabilities in the dissemination of agricultural technologies, the research relied on a practical field research method. The study sample framework consisted of the Agricultural Extension and Training Department in Baghdad Governorate, as well as the affiliated advisory and training centers and farms located in 15 Iraqi provinces.

##### 2. Human Scope of the Study Sample:

To select the research sample, all agricultural extension workers involved in the dissemination of agricultural technologies within the Agricultural Extension and Training Department, as well as the affiliated advisory centers and farms in Iraqi provinces, were identified. An equation was applied to determine the sample size based on specific criteria [11], An equation was used to select a random sample of (250) participants, representing approximately (35%) of the total comprehensive research population, which consisted of (710) individuals. This is illustrated in Table 1.



**Table 1:** Shows the comprehensiveness of the research and its percentage

Sequence	Work site	Comprehensive search	Research sample 35%
1	Headquarters of the Guidance and Training Department	191	67
2	Rehabilitation and training centre	7	3
3	Guidance center in Baghdad	22	8
4	Guidance center in Salah al-Din	15	6
5	Guidance center in Nineveh	47	17
6	Guidance Center in Tal Afar	26	9
7	Guidance center in Kirkuk	35	13
8	Guidance center in Anbar	28	10
9	Guidance Center in Diyala	33	12
10	Guidance Center in Wasit	24	8
11	Guidance Center in Babylon	84	29
12	Guidance Center in Al-Qadisiyah	24	8
13	Guidance Center in Najaf	36	13
14	Guidance center in Karbala	30	11
15	Al-Muthanna Guidance Center	14	5
16	Guidance center in Dhi Qar	35	12
17	Guidance center in Maysan	25	9
18	Guidance center in Basra	29	10
	total	710	250

### 3.3 Data Collection:

The researcher used a questionnaire as a tool for collecting information and data related to the research topic. The questionnaire was prepared to assess the level of agricultural extension workers' capabilities in the dissemination of agricultural technologies, following the scientific principles of questionnaire preparation in terms of question clarity, formulation, coherence, sequencing, and alignment with the study's objectives. The questionnaire consisted of two main parts:

1. Part One: This part of the questionnaire included statements related to identifying the characteristics of agricultural extension workers (independent variables) and their relationship to their capabilities in the process of disseminating agricultural technologies.
2. Part Two: This part of the questionnaire included statements that measured the level of capabilities of agricultural extension workers in the process of disseminating agricultural technologies.

### 3.4 Quantitative measurement of the dependent variable:

The dependent variable, which is the level of capabilities of agricultural extension workers in the dissemination of agricultural technologies, was measured using a scale that included 75 statements distributed across 8 domains of the technology dissemination process. A five-point Likert scale (Very High Ability, High Ability, Moderate Ability, Low Ability, No Ability) was used to measure the level of capabilities. Weightings (1, 2, 3, 4, 5) were assigned as corresponding values to indicate the measurement digitally. By summing up the scores obtained by the respondents, a score representing their level of capabilities in the dissemination of agricultural technologies could be obtained.



### 3.5 Statistical Analysis Tools:

After collecting, organizing, and tabulating the data, the data was analysed using the Statistical Package for the Social Sciences (SPSS) software. Statistical methods that align with the nature of the data were employed, including frequencies, percentages, and the Pearson correlation coefficient, to analyse the research data.

## 4. Research Findings:

### 4.1 Objective 1: Level of capabilities of agricultural extension workers in the dissemination of agricultural technologies.

The first objective focused on measuring the level of capabilities of agricultural extension workers in the dissemination of agricultural technologies. The research findings presented in Table (2) indicate that the theoretical range of capabilities of agricultural extension workers in the dissemination of agricultural technologies varied between a minimum value of (75) and a maximum value of (375), with a mean score of (179.81) and a standard deviation of (29.63). The respondents were divided into three categories based on their levels of capabilities: low, moderate, and high. It was found that more than half of the respondents, approximately (55.6%), fell into the low category, with scores ranging from (75 – 174). This could be attributed to the inadequate training received by agricultural extension workers in the field of technology dissemination, as well as the insufficient educational content included in the training courses.

**Table 2:** Distribution of respondents according to their level of capabilities in the field of disseminating agricultural technologies

Theoretical range		SMA	standard deviation	Ability level categories							
min	max			Low (75-174)		Medium (175-274)		High (275-375)		Total	
				number	%	number	%	number	%	number	%
75	375	179.81	29.63	139	55.6	108	43.2	3	1.2	250	100.0

Source: Research sample

### 4.2 Objective 2: Determining the relative importance of each domain of agricultural technology transfer.

The research findings presented in Table (3) indicate that the domain of agricultural systems ranked first among the domains of agricultural technology transfer with a relative importance of (53.36%). This can be attributed to the recognition by agricultural extension workers of the importance of understanding the agricultural systems specific to the targeted areas for technology dissemination. This includes knowledge of prevailing agricultural activities, farm assets, and existing public services, as well as awareness of the active institutions involved in the technology transfer process. On the other hand, the domain of evaluation of agricultural technology transfer ranked last among the domains of agricultural technology transfer with a relative importance of (42.28%). This could be attributed to the lack of training activities that focus on the role and importance of evaluation in extension programs. Evaluation is a crucial and fundamental domain for decision-makers to diagnose weaknesses, address them, and identify strengths for development and reinforcement. The failure to highlight these aspects leads to a lower level of knowledge and skills among agricultural extension workers.



**Table 3:** Ranking of the areas of dissemination of agricultural technologies according to the relative importance of each field

the field	Average score for the field	Overall score for the field	The relative importance of the field	Ranking
1-Agricultural systems	21.52	40	53.36	1
2- Performance capabilities in disseminating agricultural technology	20.96	40	52.4	2
3- Knowledge of agricultural technology	22.16	44	50.36	3
4- Methods for disseminating agricultural technologies	15.52	32	48.5	4
5- Implementing the dissemination of agricultural technologies	14.63	32	45.72	6
6- Planning the dissemination of agricultural technologies	21.51	48	44.81	5
7- Follow up on the dissemination of agricultural technologies	13.97	32	43.65	7
8- Evaluation of the diffusion of agricultural technologies	13.53	32	42.28	8

## 5. Recommendations:

Based on the research findings regarding the level of capabilities of agricultural extension workers in the dissemination of agricultural technologies, the following recommendations can be made:

1. Work on involving agricultural extension workers in specialized training courses to enhance their knowledge and skills in understanding agricultural technologies. This should include specialized technical programs and interactive workshops in various fields.
2. Engage agricultural extension workers in training courses that focus on enhancing their knowledge and skills in understanding agricultural systems. This will accelerate the adoption and dissemination of modern agricultural technologies.
3. Involve agricultural extension workers in agricultural training courses that focus on improving their knowledge of agricultural technology dissemination methodologies. This will help them choose the appropriate and effective methods for their work.
4. Include agricultural extension workers in agricultural training courses that aim to enhance their capabilities and skills in areas such as communication skills and technical proficiency. These are essential qualities for agricultural extension workers.
5. Engage agricultural extension workers in agricultural training courses that focus on improving their capabilities in planning, monitoring, implementation, and evaluation of agricultural technology dissemination processes.

By implementing these recommendations, it is expected that the capabilities of agricultural extension workers in the dissemination of agricultural technologies will be significantly enhanced, leading to more effective and efficient technology transfer in the agricultural sector.



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