



## The knowledge level of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah Al-Din governorate

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### Abstract

The research aimed to identify the level of knowledge of agricultural employees in the field of sustainable agricultural development in the district of Tikrit / Salah al-Din Governorate, and to determine a correlation between the level of knowledge of agricultural employees and some personal and functional variables represented in (age, gender, educational attainment, number of years of agricultural service, and sources of information on sustainable agricultural development). The research included all 106 agricultural employees in Tikrit district. A questionnaire was prepared to collect the required data. It consisted of two parts. The first part included the variables specific to agricultural employees represented in (age, gender, educational attainment, number of years of service in agricultural departments, and sources of information on sustainable agricultural development), while the second section included a scale for measuring the level of knowledge of agricultural employees consisting of (38) items. The results showed that more than a third of the respondents had a medium to low level of knowledge. The results also showed a significant correlation between the level of knowledge of agricultural employees and the majority of the factors studied. The researchers concluded the importance of these factors in training agricultural employees in the field of sustainable agricultural development. The researchers recommend the implementation of training courses for agricultural employees in the field of sustainable agricultural development and increasing the sources of information on sustainable agricultural development in the research area.

**Key words:** sustainable agricultural, knowledge, agricultural employees, Tikrit.

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## **Introduction**

That distinguishes a developed society is its The idea of sustainable agricultural development is one of the ideas that crystallized in the eighties, in response to the growing observation that national and international agricultural policies and programs should involve a range of environmental, economic and social issues, and be broader in scope than the traditional areas of agricultural production and achieving food security. Sustainable agricultural development and this was confirmed at the Earth Summit held in the city of Rio de Janeiro in 1992, in the agenda of the 21st century for specific programs and actions necessary to encourage sustainable agricultural development [1], and recently the issues of sustainable agricultural development received a policy of great interest in many dialogues global development [2].

The concept of sustainable agricultural development took a great interest with the beginning of the current century, since the agricultural sector is one of the leading sectors in economic activity because of its role in providing foodstuffs and absorbing the labor force, as well as providing raw materials for many industries, and this sector also contributes very significantly to preserving the environment, And in light of the increasing pressure on agricultural resources as a result of the large increase in the population, and then the improper use of fertilizers and pesticides, which led to an increase in pressure on available resources, especially agricultural lands, which led to a decrease in productivity and then a decline in the indicators of the agricultural sector in its contribution to the formation of the gross domestic product. These conditions called for adopting the issue of sustainable agricultural development, because

it achieves optimal use of all resources while preserving the rights of future generations by providing healthy and safe food from all pollutants, especially chemicals [3].

Sustainable agricultural development is a pattern of development that will establish positive relationships between the components of the agricultural ecosystem and its natural, biological and economic components to preserve, protect and develop the natural resource base to meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs [4], and agricultural development takes Sustainable in taking into account the good utilization of natural resources (land, water and air) for the benefit of successive generations in addition to the development of agricultural human resources through guiding, educating and training farmers in the field of optimal use of natural resources, where the human element plays a double role in the development process, on the one hand it is considered the target of the development process And he benefits from its positive effects on various aspects of life, and on the other hand, the human element is considered the main resource for production [5], In order for the agricultural development process to take place and to achieve its desired goals, it is necessary to ensure the participation of stakeholders in its plans and programs from the people and specialized agencies. One of these agencies is the Agricultural Extension Agency, which provides its agricultural activities and educational services to farmers to bring about desirable behavioral changes in their knowledge, skills and attitudes to make them able to participate in agricultural operations Development [6].

Agricultural development is the goal of all extension institutions that operate in the

countryside, and it is the result of the activities of these institutions. These institutions aspire to rehabilitate the human element, raise its efficiency and ensure its participation in its extension programs. Therefore, there is a relationship between agricultural extension and rural development, both of which are concerned with the human element, as agricultural extension is one of Tributaries of rural development [7].

The success of sustainable agriculture depends not only on the motives, skills and knowledge of farmers, but also on the action taken by groups or societies as a whole, and this makes the task more challenging, that is, the simple dissemination of the guiding message that sustainable agriculture can keep pace with traditional agriculture in achieving profits as well as To produce additional benefits for society as a whole will not suffice [8].

Agricultural extension is the applied tool adopted by those interested in the agricultural sector to develop and improve this sector, but this tool is no longer limited to traditional goals such as increasing production and improving it in quantity and quality, but rather it has gone beyond that to what is broader than that to include multiple axes and other sciences such as environmental issues and climate changes. And the economic and health repercussions on local communities, as well as addressing various phenomena such as poverty and unemployment, and the importance of agricultural extension has increased with the developments and changes that have taken place during recent years in the human reality in general [4].

Agricultural extension has recently become the focus of attention, as there is now a renewed recognition of the importance of disseminating and sharing agricultural knowledge among farmers, and that agricultural extension systems today have

shifted from government-run mechanisms to transfer technology to broader and more pluralistic systems of advisory services that offer a broader range of consultation and include Various actors provide it [8], and agricultural extension is one of the best approaches that can be relied upon to modernize agriculture and achieve continuous rural development because of the credibility and legitimacy enjoyed by this body that helped build and devote continuous improvement, training and qualification processes for long periods of time, and it is in that It relies on workers at different levels in performing its mission of extension, education and training of farmers to practice agricultural innovations using their available capabilities by bringing about desirable behavioral changes in their knowledge, skills and attitudes [10].

Therefore, one of the main pillars for the success of sustainable agricultural development is the existence of an effective extension apparatus that works to increase agricultural production through technological methods appropriate to the environmental, cultural, social and economic conditions of farmers in order to replace the traditional methods prevailing in the production pattern [11].

Due to the importance of the level of knowledge of agricultural employees in achieving sustainable agricultural development, the research problem is represented in the following questions:

1. What is the level of knowledge of the agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate?
2. What is the order of the research fields in descending order according to the level of knowledge of the agricultural employees represented in (the economic field, the social field, and the environmental field) in Tikrit district / Salah al-Din governorate?

3. What is the correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in the district of Tikrit / Salah al-Din governorate and the personal and functional variables of agricultural employees represented in (age, gender, educational attainment, number of years of service in agricultural departments, and sources of information on sustainable agricultural development ).

### **1.2 Research objectives:**

1. Identify the knowledge level of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate.

2. Arrangement of areas of sustainable agricultural development from the point of view of agricultural employees in Salah al-Din Governorate in descending order, represented by (the economic field, the social field, and the environmental field) in Tikrit District / Salah Al-Din Governorate.

3. Determining the correlation between the knowledge level of agricultural employees in the field of sustainable agricultural development and each of the following independent variables (age, gender, educational attainment, number of years of service in agricultural departments, and sources of information on sustainable agricultural development) in Tikrit District / Salah Al-Din Governorate.

### **1.3 Statistical Hypotheses:**

1. There is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in the district of Tikrit / Salah Al-Din Governorate and age.

2. There is no significant correlation between the knowledge level of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah Al-Din governorate and gender.

3. There is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate and educational attainment.

4. There is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in the district of Tikrit / Salah al-Din governorate and the number of years of service in agricultural departments.

5. There is no significant correlation between the knowledge level of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate and the sources of information on sustainable agricultural development.

### **1.4 Procedural definitions:**

1. Level of knowledge: an indicator that expresses information and experiences of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate.

2. Agricultural employees: graduates of agricultural colleges, institutes and preparatory schools in their various departments, working in the agricultural departments in the district of Tikrit / Salah al-Din Governorate.

3. Sustainable agricultural development: It is a strategic tool for reducing poverty and food insecurity, increasing job opportunities in remote areas, and improving the efficiency and productivity of natural resources.

4. Number of years of service: The number of years of functional service spent by the employee in the agricultural departments.

## **2. Materials and Methods:**

### **2.1 Study Methodology:**

In the light of the objectives of the study and the questions that sought to be answered, the researcher used the descriptive approach, which describes the phenomenon accurately

and expresses it quantitatively or qualitatively[12], The descriptive approach does not stop at describing the phenomenon only, but goes beyond that to identify the relationships between the variables and predict their occurrence[13].

**2.2 Research Area:**

The Tikrit district of Salah al-Din Governorate was chosen as an area for conducting the study, Tikrit district is located on the left bank of the Tigris River, 180 km north of Baghdad and 330 km south of Mosul, It is located between two latitudes (32°-34°\_42'-34°), and its area is estimated at 69.5 km<sup>2</sup>, and it rises 110 meters above sea level. 2014 with more than 230 thousand people.

**2.3 Research Population and sample:**

The sample of the study included all agricultural employees in the agricultural departments in Tikrit district, who numbered (106) employees\* belonging to the agricultural departments represented in (Salah Al-Din Agriculture Directorate, Tikrit Agriculture Division, Agricultural Research Department, and Extension Center), (29%) was taken from the population. As a survey sample, and thus the final study population became (76) employees, and the extension center was excluded from the survey sample due to the small number of employees in it, as shown in Table No. (1).

Table (1) Research community and sample.

S	Agricultural department	Total population	The survey sample	The research sample
1	Directorate Saladin Agriculture	72	21	51
2	Agricultural Research Department	20	6	14
3	Tikrit Agriculture Division	10	3	7
4	Extension center	4	-	4
the total		106	30	76

**2.4 Questionnaire Form:**

The questionnaire was used as a tool for collecting information and data from the respondents, and it was designed in its initial form in two parts, which are as follows: The first part included a set of personal questions related to agricultural employees, which are (age, gender, educational attainment, number of years of service in agricultural departments, sources

of information on sustainable agricultural development),while the second part included a measure of the level of knowledge of agricultural employees in the field of sustainable agricultural development. An initial questionnaire was prepared that included a set of questions related to the most important areas of sustainable agricultural development. shown in Table (2).

Table (2) the fields of study and items

S	domains	The number of paragraphs
1	economic field	19
2	social field	9
3	environmental field	12
the total		40

\*Salah al-Din Agriculture Directorate 2022

**2.4.1 Analysis of the questionnaire paragraphs:**

The difficulty and strength of distinguishing the paragraphs were calculated as follows:

- A.** The difficulty of the paragraphs: The aim of calculating the difficulty of the paragraphs is to determine the paragraphs that have an appropriate difficulty and to delete the very difficult or very easy paragraphs and to accept the paragraphs whose difficulty ranges between (20% - 80%). The formula for calculating the degree of difficulty was used for each item of the test, and one item was excluded from the economic field because it was outside the permissible range as shown in Table (3).
- B.** The power of discrimination of paragraphs: The purpose of calculating

the power of discrimination of paragraphs is the ability to distinguish between respondents from the category of those with high knowledge in their answers to the paragraph and the category of those with low knowledge, A special equation was used to calculate the discriminatory power of the paragraphs, and based on the EBEL scale, one paragraph was excluded from the environmental field whose discrimination power was less than (0.20). Paragraphs whose distinguishing power ranged between (0.20-0.30) were modified, and after deleting the paragraphs that were not good in terms of their discrimination or the degree of their difficulty, the final number of paragraphs became (38) paragraphs, as in Table (3).

Table (3) the number of paragraphs for each field of research

S	the field	The number of paragraphs
1	economic field	18
2	social field	9
3	environmental field	11
	the total	38

**2.4.2: Measuring Research Variables:**

**A: the independent variables:**

- 1. Age:** It was measured by the number of years of the respondent at the time of data collection.
- 3. educational attainment:** Educational attainment was measured according to the following levels (Agricultural Preparatory School, Agricultural Institute, Bachelor of Agriculture, Master of Agriculture, PhD in Agriculture), and the following codes were given to them (1, 2, 3, 4, 5) respectively.
- 4. The number of years of service in the agricultural departments:** This variable was measured by the number of years that

**2. Gender:** Gender was measured through the alternatives (male, female), and the following symbols were given to it: (2, 1), respectively.

the respondent spent in the agricultural departments.

**5. Sources of information on sustainable agricultural development:** Developing a measure for this variable through (9) sources from which the respondent can obtain information related to the field of sustainable agricultural development The alternatives were developed to respond to them (always, sometimes, I do not get) and

the following weights were assigned to them (2, 1, 0) respectively, and thus the values that each respondent can obtain range between (0-18), and the sum of the scores represents the exposure Sources of information obtained by the farmer in the field of sustainable agricultural development.

**B: Measuring the level of knowledge of agricultural employees in the field of sustainable agricultural development:**

The level of knowledge of agricultural employees in the field of sustainable agricultural development was measured using a test through (38) items distributed over (3) fields. The respondent scored one degree for the correct answer and zero for the wrong answer. Thus, the values expressing the level of knowledge of farmers are limited to between (0 - 38) degrees.

**2.5: Statistical means:**

Several statistical methods were used such as (paragraph difficulty coefficient,

paragraph discrimination power, range, arithmetic mean, percentile weight, standard deviation, Spearman's coefficient, Pearson's correlation coefficient, and the (t) test).

**3. Results and discussion:**

The results were presented and discussed according to the objectives of the study as follows:

**3.1 The first objective:**

Identify the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate.

The values expressing the level of knowledge of agricultural employees in the field of sustainable agricultural development ranged between (24-35) degrees, with an average of (31.69), and a standard deviation of (2.57). The respondents were distributed according by range and length of category, as shown in Table (4).

Table (4) Distribution of respondents according to knowledge of agricultural employees in the field of sustainable agricultural development.

S	categories	the number	percenta ge	average knowledge
1	low ( 24 - 27 )	6	7.89	26.16
2	Medium ( 28 - 31 )	23	30.26	29.73
3	High ( 32 - 35 )	47	61.85	33.36
4	the total	76	%100	

It appears from Table (4) that more than a third of the agricultural employees fall within the Medium and low category in the level of knowledge in the field of sustainable agricultural development. The reason may be the lack of training of agricultural employees in the field of sustainable agriculture and lack of awareness of its importance in development.

**3.2 The second objective: Arrangement of areas of sustainable agricultural development from the point of view of agricultural employees in Salah al-Din Governorate in descending order, represented by (the economic field, the social field, and the environmental field) in Tikrit District / Salah Al-Din Governorate.**

The study areas were arranged in descending order according to the weight

percentage, and the results were as shown in Table (5).

Table (5) Arranging the fields of study according to the level of knowledge in descending order.

S	The field	A verag	Number of the paragraphs	Weight percent	Rank
1	Economic field	15.72	18	87.3	1
2	Social field	7.39	9	82.11	2
3	Environmental field	8.58	11	78.00	3

Table (5) shows that the economic field ranked first in the level of knowledge of agricultural employees in the field of sustainable agricultural development, and the reason for this may be the agricultural employees' knowledge of the importance of this field in achieving sustainable agricultural development, while the environmental field came in the last place and the reason is due to This is due to the lack of experience of agricultural staff in this field in achieving sustainable agricultural development.

**3.3 Third Objective: Determine the correlation between the knowledge level of agricultural employees in the field of sustainable agricultural development and each of the following independent variables:**

**3.3.1: Age:** The ages of the respondents ranged between (27-59) years. They were distributed according to the range into three categories, as shown in Table (6).

Table (6) Distribution of respondents according to age groups.

scategori	the number	percentage	average knowledge	r value
Young age (27-37) years	54	59.22	31.15	0.32**
Middle age (38-48) years	25	32.89	32 . 32	
Old age (49-59) years	6	7.89	33.66	
The total	76	%100		

\*\*It indicates that the relationship is significant at the level of 0.01

Table (6) shows that the young category constitutes the largest percentage of the respondents, and that the highest level of application is in the elderly category. To find the correlation between the two variables, Pearson's correlation law was used, and the correlation coefficient value was (0.32), and to test the significance of the correlation relationship, the law (t) was used ) and it turned out that the relationship is significant at the level (0.01), and thus we reject the statistical hypothesis that states (there is no significant correlation between the level of knowledge of

agricultural employees in the field of sustainable agricultural development in the district of Tikrit / Salah Al-Din and Governorate), The reason may be that the older employees are aware of the importance of proper use of available agricultural resources in production, and this result agrees with that was found to him [14].

**3.3.2: Gender:** The respondents were distributed according to gender into two categories (male and female) as shown in Table (7).



Table (7) Distribution of respondents by gender.

categories	the number	percentage	average knowledge	r value
Male	50	65.78	31.86	0.11
Female	26	34.22	31.30	
The total	76	%100		

It is clear from Table (7) that the category of males constitutes the largest number of agricultural employees, and that the highest level of knowledge in the field of sustainable agricultural development is in the category of males. To find the correlation between the two variables, Spearman's law was used, as the value of the correlation coefficient was (0.11), and to test the significance of the correlation, the correlation was used. Law (t) and it turns out that the relationship is not significant, and thus we accept the statistical hypothesis that

states (there is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit District / Salah Al-Din Governorate and gender), and this result does not agree with that was found to him [14].

**3.3.3 Educational attainment:** The respondents were distributed according to their educational attainment, as shown in Table (8).

Table (8) Distribution of respondents according to educational attainment.

categories	the number	percentage	average knowledge	rs value
Prep	4	5.26	28.25	*0.28
institute	7	9.21	31	
Bachelor's	23	30.26	32.26	
Master's	32	42.11	31.37	
Ph.D	10	13.16	33.3	
the total	76	%100		

\*It indicates that the relationship is significant at the level of 0.05

It is clear from Table (8) that the Masters category constitutes the largest percentage of agricultural employees, and that the highest level of knowledge in the field of sustainable agricultural development is from the PhD category. The law (t) was used and it was found that the relationship is significant at the level (0.05), and thus we reject the statistical hypothesis that states (there is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit District / Salah Al-Din Governorate and educational attainment), The reason may be

that employees with higher educational attainment have knowledge of the importance of sustainable agricultural development, and this result agrees with that was found to him [15], and nor It agrees with that was found [14].

**3.3.4: Number of years of service in agricultural departments:**

The data showed that the number of years of service in agricultural departments ranged between (2-34) years. The respondents were distributed according to their range into three categories, as shown in Table (9).

Table (9) Distribution of respondents according to the number of years of service in agricultural departments.

categories	the number	percentage	average knowledge	r value
Low (2 – 12) years	55	72.37	31.2	
Medium (13 – 23) years	17	22.37	33.05	* 0.27
High (24 – 34) years	4	5.26	32.75	
total the	76	%100		

\*It indicates that the relationship is significant at the level of 0.05

Table (9) shows that the low category constitutes the largest percentage of the respondents, and that the medium level of knowledge is in the high category. To find the correlation between the two variables, Pearson's law was used, and the value of the correlation coefficient was (0.27). To test the significance of the correlation, the (t) law was used, and it was found that the relationship was significant at the level of (0.05). Thus, we reject the statistical hypothesis that states (there is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit district / Salah al-Din governorate and the number of years of service in agricultural departments), and the reason may be that agricultural employees who have long service

consist of Knowledge of how to achieve sustainable agricultural development, and this result is consistent with the findings of [15] and [14], and does not agree with the findings of [16].

### 3.3.5: Sources of information on sustainable agricultural development:

The results showed that the values expressing the level of agricultural employees' contact with information sources were limited to (8-17). The respondents were distributed according to the extent into three categories, as shown in Table (10).

Table (10) Distribution of respondents according to contact with information sources and its relationship to the level of knowledge.

categories	the number	percentage	average knowledge	r value
Low (8 – 10)	15	19.73	29.13	** 0.45
Medium (11 – 13)	25	32.90	31.88	
High (14 – or more)	36	47.37	32.63	
The total	76	%100		

\*\*It indicates that the relationship is significant at the level of 0.05

Table (10) shows that the high category constitutes the largest percentage of the respondents and that the highest level of knowledge of sustainable agricultural development is in the high category. To find the correlation between the two variables, Spearman's law was used, as the value of the correlation coefficient was (0.45), and to test the significance of the correlation, the law ( t )

and it was found that the relationship is significant at the level (0.01) and thus we reject the statistical hypothesis which states (there is no significant correlation between the level of knowledge of agricultural employees in the field of sustainable agricultural development in Tikrit District / Salah Al-Din Governorate and the sources of information on sustainable agricultural development), The reason may be

that employees are exposed to more than one source that makes them realize the importance of sustainable agricultural development and its contribution to achieving food security, and this result is consistent with what he reached by [15] and [16].

### **Conclusions:**

In light of the results of the study, we can conclude the following:

1. The results showed that more than a third of the respondents are people with medium and low knowledge in the field of sustainable agricultural development. We conclude from that the need to train agricultural employees and raise the level of their knowledge in the field of sustainable agricultural development.

2. The results showed that the economic field ranked first in the fields of research. We conclude from that the sufficient knowledge of agricultural employees of the importance of this field in achieving sustainable agricultural development, while the environmental field came in last place, and the reason for this is

development, and disseminating recommendations on a large scale, while supporting continuity of publication.

3. Taking into account the studied factors in preparing and training agricultural personnel to achieve sustainable agricultural development.

4. Increasing the number of sources of information on sustainable agricultural development, such as extension leaflets and agricultural publications, and making use of Salah El-Din channel to disseminate information on sustainable agricultural development.

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due to the need for agricultural employees to increase their knowledge in this field.

3. The results showed that there is a significant correlation between the level of knowledge and the majority of the factors studied. We conclude from that the importance of these factors in preparing agricultural employees in the field of sustainable agricultural development.

4. The results showed that there is a significant correlation between the level of knowledge and sources of information. We conclude from this the importance of sources of information in providing agricultural employees with knowledge about sustainable agricultural development.

### **Recommendations:**

1. Implementing training courses for agricultural employees in the field of sustainable agricultural development.

2. Activating the role of agricultural extension by the Salah al-Din Directorate of Agriculture in the process of transferring research results, especially in the field of sustainable agricultural

research published online at [www.Algohoria.net/attach.php.eid.12859](http://www.Algohoria.net/attach.php.eid.12859)

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## مستوى معارف الموظفين الزراعيين في مجال التنمية الزراعية المستدامة في قضاء تكريت / محافظة صلاح الدين

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• تاريخ استلام البحث 26/02/2023 وتاريخ قبوله 26/03/2023

• البحث مستل من رسالة ماجستير للباحث الاول .

### المستخلص

استهدف البحث قياس مستوى معارف الموظفين الزراعيين في مجال التنمية الزراعية المستدامة في قضاء تكريت/ محافظة صلاح الدين، وإيجاد علاقة الارتباط بين مستوى معارف الموظفين الزراعيين وبعض المتغيرات الشخصية والمتمثلة في (السن، والجنس، والتحصيل الدراسي، وعدد سنوات الخدمة في الدوائر الزراعية، ومصادر المعلومات عن التنمية الزراعية المستدامة). شمل البحث جميع الموظفين الزراعيين في قضاء تكريت والبالغ عددهم 106 موظف، أعدت استمارة استبيان لجمع البيانات المطلوبة وقد تكونت من قسمين تضمن القسم الاول منها العوامل الخاصة بالموظفين الزراعيين والمتمثلة في (السن، والجنس، والتحصيل الدراسي، وعدد سنوات الخدمة في الدوائر الزراعية، ومصادر المعلومات عن التنمية الزراعية المستدامة) بينما تضمن القسم الثاني مقياساً لقياس مستوى معارف الموظفين الزراعيين تكون من (38) فقرة، اظهرت النتائج ان اكثر من ثلث المبحوثين مستوى معارفهم متوسط الى منخفض كما اظهرت النتائج وجود علاقة ارتباط معنوية بين مستوى معارف الموظفين الزراعيين وغالبية العوامل المدروسة، استنتج الباحثان اهمية تلك العوامل في تدريب الموظفين الزراعيين في مجال التنمية الزراعية المستدامة، يوصي الباحثان بتنفيذ دورات تدريبية للموظفين الزراعيين في مجال التنمية الزراعية المستدامة وزيادة مصادر المعلومات عن التنمية الزراعية المستدامة في منطقة البحث.

**الكلمات المفتاحية:** التنمية المستدامة، المعرفة، الموظفين الزراعيين، تكريت