Knowledge needs of agricultural employees in the field of organic agriculture techniques in Ninawa Province and their relationship to some factors

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Abstract

The study aimed to identify the knowledge needs of agricultural employees in the field of organic agriculture techniques in Ninawa Province and their relationship to some factors in general, and to investigate the correlation between the knowledge needs of agricultural employees and some of independent variables (age, job experience, academic specialization, desire for innovation, and participation in extension activities). It also aimed to identify the obstacles facing agricultural employees in implementing organic farming techniques. The study population included all agricultural employees working at the headquarters of the Ninawa Agriculture Directorate and its affiliated agricultural divisions, The total population size was 362 agricultural employees distributed across the directorate and its divisions. A simple random sample was taken, taking into account the proportionality of the sample selection at 52% of the total population, so, the final sample size to 180 respondents. To collect data, a questionnaire was prepared consisting of three parts. The first part included the personal characteristics of the respondents. The second part included a scale of 52 items to measure the knowledge needs of organic farming techniques. The third part included a four-part scale consisting of 16 items regarding the obstacles facing agricultural employees.

The research results showed that identifying the knowledge needs of agricultural employees in the field of organic farming techniques in general is an average that tends to rise. The results also showed that there is a correlation between knowledge needs and each of the following independent variables: length of job service, desire for innovation, and participation in extension activities. While there was no correlation between knowledge needs and age, academic specialization, and professional ambition.

The research recommended that the extension center should hold training courses to increase the awareness of respondents in adopting organic farming techniques, and the Ninawa Agriculture Directorate should provide technical and material support to facilitate the implementation of organic farming techniques in the research area.

Key Words: Knowledge needs, Organic agriculture techniques, employees, Ninawa, Iraq.

Introduction:

Organic agriculture is consider as a modern trend in agricultural production. It aims to achieve environmental balance and improve the quality of agricultural products by reducing the use of chemicals and enhancing soil fertility through natural ways. With the increasing global trend towards agricultural sustainability, the need to develop knowledge and skills related to these techniques has become essential, especially in areas that rely on agriculture as a primary source of income, such as the Ninawa Governorate in Iraq (2). With the rapid scientific development in

agriculture and the growing population, reliance on chemical fertilizers, pesticides, fungicides, and other chemicals to increase agricultural production has increased. However, these practices have led to an ecological imbalance and caused environmental problems such as desertification, drought, soil salinization, water and air pollution, and the loss of many plant and animal genetic resources (3). The extensive use of chemical fertilizers and pesticides has led to the deterioration of natural resources, negatively impacted human and animal health, and the emergence of new, previously unknown epidemics and diseases, in addition to increasing agricultural production costs (1 .(

As a result of these risks, a global trend has emerged toward organic agriculture, which focuses on the use of natural inputs and sustainable agricultural technologies to protect the environment and achieve healthy and safe food production (14 .(

Organic agriculture contributes to improving environmental balance by reducing the use of harmful chemicals. Studies indicate that adopting these practices leads to improved soil quality and the sustainability of agricultural resources (16). Some studies have shown that productivity in organic agriculture may exceed that of conventional agriculture up to 33% (12). Furthermore, this agricultural model contributes to reducing production costs and improving the quality of agricultural products, which increases consumer demand for organic products (11). Other studies have confirmed that the absence of synthetic fertilizers in organic farming helps preserve soil biodiversity and improve its biological activity (7). Despite these benefits, the application of organic farming techniques remains limited in many regions, including Iraq, this is due to a lack of specialized knowledge among agricultural staff, weak training programs targeting this group, in addition to the lack of information sources related to these techniques (15 .(

Achieving agricultural sustainability also requires the efforts of agricultural extension, which plays a major role in transferring knowledge to farmers and informing them of the importance of adopting organic practices to reduce environmental damage (10). Other studies have shown that agricultural extension is the primary means of changing farmers' practices and motivating them to adopt sustainable technologies, by raising awareness of the environmental risks of chemical fertilizers and pesticides and training them on environmentally friendly agricultural alternatives (9 .(

This study aims to examine the knowledge needs of agricultural employees in Ninawa Governorate regarding organic farming techniques. It also analyzes the factors that may influence these needs, such as educational attainment, number of service years, academic specialization, workplace, career aspirations, desire for innovation, information source, and participation in extension activities. This study highlights the knowledge gaps and challenges facing employees in adopting organic practices, which will help develop effective training and extension strategies to enhance agricultural knowledge and develop the practical skills of agricultural workers.

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Research objectives :

.2Identify the correlation between the knowledge needs of agricultural employees and the following independent variables: (age, length of service, academic specialization, desire for innovation, and participation in extension activities .(

.3Identify the obstacles facing agricultural employees in implementing organic farming techniques

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Materials and Methods

The Ninawa Agriculture Directorate (directorate headquarters and its affiliated agricultural divisions) was selected as the research area. The study population included all agricultural sector employees at the Nineveh Agriculture Directorate headquarters, as well as the associated agricultural divisions, in addition to the Extension Center, which comprises (34) extension farms. The total population size was (362) agricultural employees distributed among the directorate and its divisions. A preliminary test sample of (30) employees was excluded for use in measuring reliability. A simple random sampling method was used, taking into account the proportionality of the selection of (52%) of the total population, bringing the final sample size to (180) respondents. Only (16) questionnaires were completed during data collection. A three-part questionnaire was used. The first part included data related to the independent personal variables of agricultural employees (age, academic specialization, length of service, desire for renewal, and participation in extension activities). The second part included the dependent factor (cognitive needs of agricultural employees in the field of organic farming techniques in Nineveh Governorate) and included three fields (agricultural cycles (15), organic fertilizer (14), biological control (13), plant extracts (10), with (52) items. For each field, a set of items were created for the researcher to answer, covering the scientific area of the field. The total number of items included in the fields was (52) distributed over the four research fields. To ensure reliability, a random survey sample of (30) employees was selected from the total research community. The reliability of the research fields and the overall scale of the research was calculated using (Cronbach's alpha method) with the (SPSS) program. The reliability value reached (0.90). The third part included a four-point scale consisting of 16 items related to the obstacles facing agricultural employees. Four alternatives were created for each obstacle, which are: greatly hindering, moderately hindering, slightly hindering, no hindering, and numerical values were assigned to them, which are: 1, 2, 3, 4 respectively.

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Measuring research variables:

.1Independent variables :

-Age: Determined based on the number of years of age of the respondents at the time of data collection .

-Employment Experience: Determined based on the number of years the respondent has spent in their job .

-Academic Specialization: Determined by asking respondents about their specialization, whether they specialized in agricultural extension or not, with codes (2, 1) assigned, respectively .

-Desire for innovation: Measured across 8 items, using a graduated scale including levels (often, sometimes, rarely), with codes (1, 2, 3) assigned to answers related to positive items and (3, 2, 1) assigned to negative items. The total score indicates the degree of desire for innovation .

-Participation in extension activities: This was measured using nine items representing extension activities, with alternatives (often participate, sometimes participate, never participate), and codes (3, 2, 1) were assigned, respectively .

.2Measurement of the dependent variable: (Knowledge needs of agricultural employees in the field of organic farming techniques in Ninawa Governorate) in the areas of crop rotations, organic fertilizers, and biological control. Knowledge needs were measured by assigning the following alternatives to each item: (I need to a great extent, I need to a moderate extent, I need to a small extent, I do not need), and the following alternatives (4, 3, 2, and 1) were assigned to them, respectively. By summing each respondent's responses to the item categories, we obtain the final score for each respondent on the item categories of the research areas. This score represents the final score for each respondent on the research areas. This result represents the opinion of agricultural employees regarding organic farming techniques in Ninawa Governorate

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Results and Discussion :

Objective 1: To identify the knowledge needs of agricultural employees in the field of organic

farming techniques in general.

The study results showed that the lowest numerical value for the knowledge needs of agricultural employees in the field of organic farming techniques was (62), and the highest value was (248), with an arithmetic mean of (156.889), and a standard deviation of (33.737). The respondents were divided into three categories according to the theoretical range, as shown in table (1.(

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Table (1). Distribution of respondents according to the level of knowledge needs for organic farming techniques

Need level categories	frequency	%	Average need in each category
Low (62-124)	26	13.26	97.625
Medium (125-185)	125	69.44	213.162
High (≥186)	29	16.12	167.951
The total	180	100	-

The table above shows that the highest percentage of respondents were into the medium category (125-185) at 69.44%, followed by 16.12% of respondents in the high category (186-248), while the lowest percentage fell into the small category (62-124) at 14.44%. This indicates that approximately three-quarters of the respondents had a medium to high need for knowledge in the field of organic farming techniques. This result is inconsistent with the studies of(4) and) 8), but is consistent with) 5) and) 15). This means that the majority of the respondents in Ninawa Governorate lack agricultural knowledge and experience related to the use of organic farming technology. This may be due to the lack of application of this technology and its limited use on a wide scale in the research area, as well as to the relative newness of this technology to the respondents and the lack of application of this technology. This is what was confirmed by (12) that new or modern innovations and technologies do not only require knowledge, but rather go beyond that and require a certain periods. During this periods, ideas become more clear to individuals about trends, whether positive or negative, towards new technologies, on the one hand, and to the lack of extension services and activities, such as the lack of specialized training courses in the use and application of this technology, on the other hand.

Objective 2: To identify the correlation between the knowledge needs of agricultural employees and the following independent variables (age, career experience, academic specialization, desire for innovation, and participation in extension activities.(

Age :

According to the extracted results, it was found that the youngest age of the respondents was (27) and the oldest was (62) years, and they were classified into three categories: young (27-38 years) at a rate of (56.667%), middle (39-50 years) at a rate of (7.778%), and old (51-62 years) at a rate of (35.555%). The young category represented the majority, which reflects that the majority of agricultural employees are in a relatively active age group (table.2 .(

Table (2) shows the distribution of respondents according to the age variable.

Age groups	Frequency	%	r value	P value
27-39 year	102	56.667	0.025	0.736 NS
40-52 year	14	7.778		
53-65 year	64	35.555		
Total	180	100		

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To find the correlation between knowledge needs and age, a simple Pearson correlation coefficient was used, with a value of 0.025, indicating a non-significant relationship between the two variables, according to a P-value of 0.736. Therefore, we accept the null hypothesis, which states that there is no significant correlation between knowledge needs and age. This may be due to the fact that most of the respondents are young or inexperienced, which is reflected in their limited knowledge of organic farming techniques. This result is inconsistent with the studies of) 4) and) 8 .(

Career experience: (Length of service in the job (

The length of employment of the respondents ranged from 1-39 years, and they were classified into three categories: short (1-13 years) (2.222%), medium (14-26 years) (47.778%), and long (27-39 years) (50.000%). The majority were in the medium category, reflecting average professional experience for most employees (table. 3(

Table (3) shows the distribution of respondents according to the variable of service duration.

Categories of length of service	Frequency	%	r value	P value
1-13 year	86	2.222	0.093	0.168*
14-26 year	90	47.778		
27-39 year	4	50.000		
Total	180	100		

To find the correlation between cognitive needs and length of job service, the simple Pearson correlation coefficient was used, with a value of (0.093), which indicates a significant relationship between the two variables according to its value (P value = 0.168). This indicates the existence of a significant correlation between knowledge needs and length of job service. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is a significant correlation between length of service and knowledge needs of agricultural employees. This indicates that half of the respondents have high job service. This may be due to the fact that the long number of years of the respondents increases their experience and broadens their awareness of various agricultural topics as a result of their acquisition of knowledge from scientific and practical practice, which is reflected in increasing their knowledge of organic farming techniques. This result is not consistent with the study of (4) (12.(

Academic specialization: The percentage of respondents specializing in agricultural extension was (17.778%), while the percentage of non-specialists was (82.222%), (table. 4.(

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. Table (4). The distribution of respondents according to the academic specialization variable

Academic Specialization Categories	Frequency	%	rs value	P value
Specialized in Agricultural Extension	32	17.778	-0.101	0.177 NS
Non-Specialized	148	82.222		
Total	180	100		

To find the correlation between knowledge needs and academic specialization, Spearman's rank correlation coefficient was used, with a value of (-0.101), which indicates an insignificant relationship between the two variables according to its value (P value = 0.177). Therefore, we accept the null hypothesis that states that there is no significant correlation between knowledge needs and academic specialization. The reason for this may be that the agricultural curricula in agricultural secondary schools or agricultural institutes and colleges with their various specializations are devoid of courses related to organic agriculture topics, so the specialization is not related to their knowledge needs. This result is not consistent with the study of (8) (11.(

Desire for agricultural Innovation:

Desire for innovation, which reflects employees' willingness to adopt new and innovative methods, ranged from 8-22 points. Respondents were divided into three categories: low desire for innovation (8-12 points) (2.222%), medium desire (13-17 points) (22.778%), and high desire for innovation (18-22 points) (75.000%), (table. 5). These results show that the majority of respondents have a high desire for innovation, indicating their interest in learning new methods and techniques to improve agricultural performance

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Table (5). shows the distribution of respondents according to the desire for innovation variable

Categories of desire for Innovation	Frequency	%	r value	P value
8-13	4	2.222	0.309	0.171**
13-17	41	22.778		
18-22	135	75.000		
Total	180	100		

To find the correlation between knowledge needs and the desire for innovation, Pearson's rank correlation was used, with a value of 0.309, indicating a high significant relationship between the two variables according to a P value of 0.171. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is a significant correlation between knowledge needs and the desire for innovation. This result highlights the importance of personal

motivation in reducing knowledge needs. Employees who have a desire for innovation are more willing to develop their knowledge and acquire new skills in the field of organic farming techniques. The result also reflects that training and guidance programs targeting employees with a high desire for innovation may be more effective in raising their knowledge level .

Participation in extension Activities :

Participation in guidance activities ranged from (9-27) points, and the respondents were classified into three categories: low participation (9-14 points) at (5.000%), medium participation (15-20 points) at (8.333%), and high participation (21-26 points) at (86.667%), (table. 6). The vast majority of the respondents belonged to the high participation category, reflecting their interest in participating in extension activities that provide valuable information and experience .

Table (19) shows the distribution of respondents according to the variable of participation in extension activities.

Categories	Frequency	%	r value	P value
9-14	9	5.000	0.277	0.182**
15-20	15	8.333		
21-26	156	86.667		
Total	180	100		

To find the correlation between the knowledge needs of participating in extension activities, Pearson's rank correlation coefficient was used, with a value of (0.277), indicating a high significant relationship between the two variables according to the P-value = 0.182. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is a significant correlation between participation in extension activities and the knowledge needs of agricultural employees. Employees who regularly participate in extension activities are more aware of organic farming techniques and have a lower need for knowledge compared to their peers who participate in limited ways. This result confirms the importance of extension activities as an effective tool for transferring knowledge and developing the skills of agricultural employees. This result is inconsistent with the study of (6) (10.(

Objective 3 :

Obstacles facing employees in Implementing organic agriculture technologies.

The item (Lack of specialized extension staff) occupied the top spot, (table. 6), perhaps due to the weak extension role in the research area in the field of organic agriculture. Successful transfer and application of this technology requires the support and development of support services institutions in the fields of agricultural research, extension, training, and information exchange. This is aimed at overcoming structural and institutional obstacles, shifting towards organic agriculture, developing this production, and expanding the base for obtaining safety certifications. This is achieved by expanding the extension and training base to include the largest possible

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number of small farmers, so that organic production does not become a monopoly for large farmers. Furthermore, organic research must be linked and coordinated with the fields of education, training, and extension, and directing extension and training programs towards developing marketing and consumer extension services

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Table (6) shows the ranking of the items on the obstacles facing employees according to relative importance.

Sequence in Scale	Item	Weighted Average	Relative Importance	Rank
1	Lack of specialized advisory staff in the field of organic agriculture	3.478	86.950	1
14	Need to increase the workforce	3.350	83.750	2
13	Difficulty of marketing organic products in the market	3.322	83.050	3
2	Lack of knowledge and experience of extension agents as a source of information on organic farming	3.300	82.500	4.5
9	Lack of organic fertilizers	3.300	82.500	4.5
7	Weak government role in financial support for the implementation of organic agriculture	3.294	82.350	6
11	Low financial return due to low production in general	3.267	81.675	7
5	Lack of availability of organic agricultural requirements	3.256	81.400	8
3	Lack of extension activities to educate farmers about organic farming methods	3.222	80.550	9
12	Ineffectiveness of laws to monitor the protection of organic products from fraud	3.206	80.150	10
4	The high cost of purchasing organic products for consumers	3.183	79.575	11
10	Difficulty in obtaining organic certification for products	3.178	79.450	12
8	Lack of media and promotional role for organic farming	3.167	79.175	13
6	Lack of institutions providing technical support for organic agriculture, such as organizations	3.144	78.600	14

While the item (the lack of entities providing technical support for organic farming, such as organizations) came in last place with an arithmetic mean of (3.144), the reason for this may be due to the lack or absence of organizations, whether governmental or non-governmental, that support organic farming in the research area, which made this item of little importance to the respondents

Conclusions:

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According to the results, the researcher can conclude the following :

.1We conclude that agricultural employees lack sufficient experience and knowledge in the field of organic farming techniques in general. Therefore, their knowledge and awareness in this field must be developed by exposing them to modern sources in this field and opening up to the outside world .

.2We conclude that there is a significant correlation between agricultural employees' knowledge needs and their desire for innovation. The importance of personal motivation in reducing knowledge needs is highlighted, as is their desire for innovation, which makes them more willing to develop their knowledge and acquire new skills in the field of organic farming techniques .

.3We conclude that there is a significant correlation between the knowledge needs of agricultural employees and their participation in extension activities in the field of organic farming techniques. This is due to the scarcity of extension activities and programs in the field of organic farming techniques .

.4We conclude that there is a significant correlation between the knowledge needs of agricultural employees and their participation in the length of their employment .

.5We conclude that the most significant obstacle facing agricultural employees in the field of organic farming techniques is the lack of specialized extension staff. This lack of knowledge is compounded by the weakness of the extension structure directed towards organic farming due to the lack of training programs for agricultural extension workers

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Recommendations :

.1The Extension center should hold training courses to increase the awareness of respondents in adopting organic farming techniques .

.2The Ninawa Agriculture Directorate should provide technical and material support to facilitate the implementation of organic farming techniques in the research area .

.3The agricultural divisions in the research area should intensify extension efforts to help increase the application of organic farming techniques among farmers through the publication of extension posters and informational materials.

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