

Training needs of vegetable farmers in Rabiaa district / Ninewa Governorate in the field of rationalizing irrigation water and maintaining water sustainability

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I. ABSTRACT

The research aimed to estimate the training needs of vegetable farmers in the Rabia, Nineveh Governorate, in the field of irrigation water rationalization, determining the correlation between the training needs of farmers and the following independent variables (age, educational level, possession of irrigation systems, type of irrigation machine used, degree of farmers' awareness of the importance of rationalizing irrigation water). A simple random sample was selected using Stephen's equation, where the sample size after applying the equation was (156) farms, representing (62%) of the total sample, and incomplete forms in their information and adults were excluded. Their number was two, and thus the final number reached (154). A questionnaire form was prepared consisting of two parts, the first part included some independent variables for farmers in the research area. The second part includes a special scale to measure the training needs of vegetable farmers in Rabia district, in the field of rationalizing irrigation water and maintaining water sustainability. The results showed that the level of training needs of farmers is moderate and tends to be high. The results also showed that the area that ranked first for the training needs of vegetable farmers is: (Means and methods of the agricultural drainage system), while the field of (irrigation efficiency) ranked last in the ranking of rationalization areas. Use irrigation water according to its priority. The results also showed that the paragraph ranked first in the ranking of the paragraphs in each area of rationalizing the use of irrigation water. In the field of modern techniques for rationalizing irrigation water, they are (how to line irrigation canals to conserve water). The paragraph that ranked first in the field of means and methods for improving the agricultural drainage system is (How to use covered drains). The paragraph that ranked first in the field of efficiency of irrigation methods is (regulating the sprinkler speed according to the properties of the soil). The paragraph that ranked first in the field of recommendations related to irrigating crops is (Knowing the water needs of each crop). The results also showed that there is a significant correlation between training needs and (age, educational level, possession of irrigation systems, type of irrigation machine, and degree of farmers' awareness of the importance of rationalizing irrigation water).

II. INTRODUCTION

The water problem is no longer just a shortage in quantity compared to the increasing demand for it, but rather this extends to the quality of the water, as it is constantly deteriorating, and the beginning of this deterioration was after filling the Keban reservoir. In Turkey, the entry of



drainage water into the two rivers, especially the Euphrates, and the decline in financial imports over the past years contributed to an increase in salt concentrations in Tigris, Euphrates and Shatt al-Arab rivers (2). The salinity increased from (250) parts per million to (3000) parts per million, which means that it increased by (15) times As it should be, ensuring the exploitation and preservation of water has become more important than before by giving it (6). The mismanagement of water resources at the level of productive farmers, where irrigation water is wasted and traditional methods continue to be used In irrigation, with encroachments on riverbeds, and the weak interest of the state, represented by the Ministry of Water Resources, in preserving this natural resource In terms of constructing reservoirs and dams, and conducting periodic maintenance operations, with the overlapping policy of the participating countries in reducing imports of Tigris and Euphrates water With climatic factors represented by high temperatures, increased evaporation rate, decreased rainfall, as well as increased The demand for water versus the increase in population are all factors that helped cause the water crisis (5). This led to the researcher's interest in studying the issue of water management. Preserving and rationalizing it, and that our Arab region is suffering from a crisis in water resources as a result of their scarcity on the one hand, and their mismanagement on the other hand Although many developed and developing countries are quick to implement and adopt integrated water resources management, The world is still lagging behind in implementing and adopting it despite the crises it suffers from in water resources (7). Although Iraq has two large rivers: the Tigris, Euphrates, Shatt al-Arab, and the marshes Dams, however, have been suffering since the 1990s from a decline in water resources, and the continuation of this shortage limits the expansion of land cultivation And to recover it, and because successive governments did not take the necessary measures to get out of this problem, which is difficult to overcome in the future, given the causes of this problem or crisis Many, including natural, human, social and political (4), given the limited water resources and the difficulty of increasing them He expected an imbalance between its supply and the increasing demand in the coming years, creating a water gap estimated at about (8 billion cubic metres) in 2025 Therefore, it has become necessary for current and future water policy to focus on several axes and mechanisms. Various issues, most notably rationalizing the use of irrigation water In the agricultural sector, which consumes about 83 percent of the total cultivated area, especially since it represents one of the sustainable development goals The water loss from this type of irrigation is estimated at about (1.8) cubic meters of water annually as a result of farmers' wrong practices And irrational behaviors represented by severe waste in the use of irrigation water. The use of dilapidated pipes and lack of awareness regarding the optimal needs for each crop And methods for rationalizing the use of irrigation water under the two systems (surface and traditional irrigation) (8). Training has an important role in developing human performance, and since the human element is one of the most important elements of production, the exploitation of the factors of production depends on it Other (3) Training is considered the basis of community development, and because the workforce is the basic element in the production process, their training is one of the factors Which contributes significantly to increasing productivity, and that extension training focuses on all workers in the agricultural sector, including agricultural employees, farmers, and leaders Local people, rural leaders, rural youth, and rural women to increase their knowledge and knowledge, modify their attitudes, and acquire modern technologies.(1). In order to determine the knowledge levels of farmers and



determine their intellectual and cognitive capabilities in the field of irrigation water rationalization, it is necessary to know the shortage occurring and bridge the gap between Mahwa It is and what should be in the field of their knowledge of irrigation water rationalization and that through training needs assessment, for them as the first and most important step in the training

process The success of extension training is usually measured by success in identifying and identifying training needs, where training can be conducted, and planning training Without knowing the training needs of vegetable farmers, to ensure that farmers implement modern irrigation methods, it is necessary to determine (16),(17). Their current needs and determining the gap between these needs and the level required to be achieved, by studying their training needs, which will provide information to farmers in the future They were trained on how to use irrigation methods and how to rationalize irrigation water, which led to the researcher's interest in studying the subject of water management, preservation and rationalization.

RESEARCH OBJECTIVES

1. Estimating the training needs of vegetable farmers in Rabia district in the field of irrigation water rationalization in general
2. . Arranging the training needs of farmers in Rabia district in each field of irrigation water rationalization and in each paragraph of each field
3. . Determine the correlation between the training needs of vegetable farmers in Rabia district and the following independent variables (age, educational level, possession of irrigation systems, Type of irrigation machine used, Degree of adequacy of irrigation water, Degree of farmers' awareness of the importance of rationalizing irrigation water, Farm tenure, Extension activities implemented by the extension agency, Training in the field of irrigation water rationalization).

Research Hypotheses:

- 1- There is no clear correlation between the training needs of vegetable farmers in the Rabi'a area and the age variable.
- 2- There is a clear significant relationship between the training needs of vegetable farmers in the Rabia area and their level of education.
- 3- There is no clear significant correlation between the training needs of vegetable farmers in the Rabia area and the ownership variable of irrigation systems.
- 4- There is no clear significant relationship between the training needs of vegetable farmers in the Rabi'a area and the type of irrigation equipment used.
- 5- There is no clear significant correlation between the training needs of vegetable farmers in the Rabi'a area and the variable of irrigation water adequacy.
- 6- There is no clear significant correlation between the training needs of vegetable farmers in the Ribi'a region and the variable of farmers' perception of the importance of rationalizing irrigation water.



- 7- There is no clear significant relationship between the training needs of vegetable farmers in the Rabi'a area and the variable of agricultural holding.
- 8- There is no clear significant correlation between the training needs of vegetable farmers in the Rabi'a area and the variable advisory activities implemented by the advisory body.
- 9- There is no clear significant correlation between the training needs of vegetable farmers in the Rabi'ah region and the training variable in the field of irrigation water conservation.

III. MATERIALS AND METHODS

The research population included all 250 farmers in the Rabia area, known for growing vegetables and following irrigation methods, and then elected a simple random sample using Stephen's equation After applying the equation, the sample size reached (156) farms, representing (62%) of the total sample, and then excluding the two incomplete forms in its information Thus, the final number reached (154) farmers, and the sample was limited to some Villages in Rabia district that rely solely on modern irrigation methods. For the purpose of collecting data, a two-part questionnaire was prepared, the first part of which included a number of variables Namely, age This variable was evaluated by calculating the number of years of age of the farmer during the data collection process. Educational level: This variable was assessed according to the following levels (illiterate, reading and writing, elementary, middle, junior high, college, graduate degree) Numeric codes (7,6,5,4,3,2,1) were assigned to each level respectively. Possession of irrigation systems: This variable was evaluated according to the following levels(Non-possessor, possessor of one system, possessor of more than one system) and numerical codes (3, 2, 1) were allocated to them for each level, respectively. Type of irrigation machine used: This variable was evaluated by asking participants about the type of machine used in water irrigation, which includes (spray irrigation, drip irrigation, bubble irrigation, and others whose name is mentioned) Numerical codes were assigned to each type (4,3,2,1) for each level respectively. The degree to which farmers realize the importance of rationalizing irrigation water: This variable was evaluated with a number of (8) paragraphs, and four alternatives were placed in front of each paragraph(I perceive to a large degree, I perceive to a medium degree, I perceive to a small degree, I do not perceive) and were assigned numerical values (1,2,3,4) for each level, respectively. Thus, the numerical value obtained by the subject ranges from (8) as a permission limit to (32) as a maximum, and the sum of the scores is representative of this variable.

The second part: It included a measure of the training needs of vegetable farmers in the Rabia region in the field of rationalizing irrigation water and maintaining water sustainability, and then identified (60) paragraphs distributed into four areas This is done by referring to previous research and studies and then presenting the paragraphs to specialists in the Soil Sciences Department and specialists in the Department Dams and water resources to determine the validity of the paragraphs and the relative importance of each area of research. For the purpose of ensuring the validity of the paragraphs in their



initial form The paragraphs were presented to a number of specialists in the field of agricultural extension and specialists in the field of soil science and water resources in order to achieve the apparent validity of the tool Research, as well as content validity was achieved by presenting the items to specialists in the Department of Dams and Water Resources and the Department of Soil and Water Resources to determine the validity of the items Determine the relative importance of each area of research.To measure stability, the researcher collected data for the survey sample Using a questionnaire specially prepared to measure what the researcher wanted to measure, the stability coefficient was also determined using an equation (alpha Cronbach), This method is used to estimate the stability of opinion polls and provides the minimum value of the reliability coefficient.The Cronbach's alpha equation shows that the value of the overall stability coefficient was (0.971).

The researcher took the process of collecting data from 11/7/2024 until 12/30/2014, through a manual questionnaire and personal interviews with the participants using the form

IV. RESULTS AND DISCUSSION:

The first goal: Estimating the training needs of vegetable farmers in Rabia district in the field of irrigation water rationalization in general.

The training needs were divided into three categories using the arithmetic mean and standard deviation, where the arithmetic mean was collected, which had a value of (209) degrees With the standard deviation reaching (5) degrees first, then subtracting the standard deviation from the arithmetic mean second to determine the middle category Which ranged between (204-214) degrees, and the lowest numerical value reached (57) degrees, while the highest numerical value reached (228) degrees, as shown in Table No.(1) , this measure consisted of (60) items distributed into four areas: (The field of modern technologies for rationalizing irrigation water, means and methods for improving the agricultural drainage system, efficiency of irrigation methods, recommendations related to crop irrigation). The questionnaire form was presented to specialists in agricultural extension to achieve

apparent honesty and specialists in the Soil Sciences Department And the Department of Dams and Water Resources to achieve content accuracy by identifying the paragraphs and the relative importance of each area of research Stability was calculated using the Fakronbach method, and the value of the overall stability coefficient reached (0.971), after data collection was completed It was classified, transcribed, and analyzed using SPSS software.

Table (1) shows a classification of the training needs of vegetable farmers in the field of irrigation water rationalization in general

Average need in each category	%	F	groups	level of need
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200	10.390	16	(57-203) degrees	Low
2 Scores expressing needs 08.615	75.325	116	204-214)) degrees	Medium
216.727	14.285	22	(215-228) degrees	High
	100	154	Total	
Arithmetic mean (209) Standard deviation (5)				

It is clear from Table (1) that the percentage of farmers whose training needs were average and the arithmetic mean was a score followed by a percentage (14.285%) Of the farmers' training needs are large and the arithmetic average (216.727%) score, which means that the level of training needs of average farmers tends to increase and this result confirm the lack of farmers' knowledge and information in the field of irrigation water rationalization, and the reason for this may be due to the farmer's lack of knowledge of practices Regarding rationalizing the use of irrigation water and the lack of exposure of farmers to training courses, and this is what the results of the research in the training courses variable showed, see Table No.(19) This result is consistent with a study (10).

The second goal: Arranging the training needs of vegetable farmers in Rabia district in each area of irrigation water rationalization and in each paragraph of each area.

It is clear from the results, Table (4), that the area that ranked first for the training needs of vegetable farmers in Rabia district is the area of (means and methods of the agricultural drainage system) With a weighted arithmetic mean (3.507%), followed by a field (recommendations related to crop irrigation) with a weighted arithmetic mean (3.505%), followed by a field (Modern technologies for rationalizing irrigation water) with a weighted arithmetic average (3.488%) and finally the field of (irrigation irrigation efficiency) with a weighted arithmetic average .

Table (2) shows the areas of training needs for vegetable farmers in Rabia district

rank	relative importance	Weighted average	Numero Vertebrae	areas
3	69.761	3.488	19	The field of modern technologies for rationalizing irrigation water
1	70.131	3.507	9	Means and methods for improving the agricultural drainage system
4	68.982	3.449	19	Efficiency of irrigation methods
2	70.109	3.505	10	Recommendations related to irrigation of crops



Maximum score (4)

We note from Table (2) that the field (means and methods of the agricultural drainage system) ranked first, and the reason for this may be due to the need of farmers and their knowledge of the importance Recycling agricultural drainage water and benefiting from it, because if the drainage water leaks into the soil and is present in abundance in the soil, it leads to an increase in the salinity of the land Its productivity deteriorates, and with continuity, the land turns into land unsuitable for agriculture and becomes desertified, while the field (efficiency of irrigation methods) ranked last The reason for this may be that irrigation methods have become a necessity at the present time and are considered basic water-saving methods in light of the scarcity of water It makes farmers realize the pros and cons of each method and thus they have less need for this field compared to other fields. The training needs of farmers are arranged paras In the field of rationalizing irrigation water and maintaining water sustainability from the point of view of farmers according to relative importance and then They are

arranged in descending order according to their arithmetic averages obtained by each paragraph, as shown in the following tables.

Table (3) Arrangement of paragraphs in the field of modern technologies for rationalizing irrigation water

rank	relative importance	Weighted average	Paragraphs
4	88.961	3.558	Knowledge of modern agricultural methods that reduce the use of irrigation water
1	91.721	3.669	How to line irrigation canals to conserve water
3	89.935	3.597	How to disinfect drains to reduce pollution
2	90.097	3.604	How to plant early ripening varieties to provide irrigation water
13	86.526	3.461	Weed control methods in the field to reduce water loss
5	88.149	3.526	Laser leveling the ground to distribute irrigation water regularly how to
16	85.877	3.435	Close drainage holes before watering
11	86.688	3.468	Know the extent of the damage caused by rising water levels
11	86.688	3.468	The need for watering at frequent intervals
9	86.851	3.474	Use organic fertilizer to maintain soil moisture



11	86.688	3.468	How to irrigate one line and leave another line
17.5	84.740	3.390	How to add agricultural gypsum to lands to preserve the soil from salinity
7	87.500	3.500	How to add agricultural sulfur to the land to strengthen it
17.5	84.740	3.390	Download agricultural crops methods
6	88.149	3.526	Leave space for maintenance
14	86.201	3.448	How to develop environmental reality through the use of environmentally friendly technologies
8	87.175	3.487	How to divide the land into basins saves in a number of hours
15	86.039	3.442	How to create ponds to benefit from rainwater for irrigation
19	84.091	3.364	Deep plowing under the soil to increase soil porosity and retain moisture

It is clear from Table (3) that the paragraph that ranked first during the ranking of the paragraphs from the farmers' point of view is (how to line irrigation canals to conserve water) with a weighted arithmetic average(3,669) degrees. This indicates that farmers realize the importance of lining irrigation canals, as they prevent the growth of weeds that reduce the flow Water, as well as lining irrigation canals, reduces water loss resulting from leakage in the side canals, allowing the provision of larger quantities of water. The paragraph that ranked last is: (Deep plowing under the soil to increase soil porosity and retain moisture) with a weighted arithmetic average of (3,364) degrees. This means that most Farmers practice deep tillage because of its role in improving soil permeability and loosening the soil. It also enhances water drainage and reduces water accumulation problems The roots absorb and retain moisture, which makes them not an obstacle or problem for farmers.

Third: Determine the correlation between the training needs of vegetable farmers in Rabia district and the following independent variables (age, educational level, possession of irrigation systems, type of irrigation machine used, degree of farmers' awareness of the importance of water rationalization).

1Age: The ages of vegetable farmers were classified into three categories, where it was found that the youngest age was (23) years and the oldest age was (64) years. The respondents were distributed into three age categories Using the actual range, the results showed that a percentage (54.6%) of the respondents are of middle ages, as shown in Table (11).

Table (4) Classification of respondents according to age variable

0.030	*0.175	22.7	35	23-36 years	old
		54.6	84	37-50 years	
		22.7	35	51-64 years	



		%100	154	Total	
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*Significant at (0,05) level

To find the correlation between age and the training needs of vegetable farmers, the Pearson correlation coefficient was used, which reached a value of which is a significant value at my level(0.05) That is, there is a correlation between the two variables, and thus we reject the null hypothesis and accept the alternative that states the existence of a "significant correlation." Statistics between training needs and age) The reason for this may be that farmers’ need for training increases as they get older to increase their knowledge and awareness of the importance of training.

2- Education level: The categories of respondents were classified according to the apparent ranks of educational level in Table (12), where it is clear from the table that (5.844%) Of the illiterate researchers, their training needs were great, and the lowest percentage of them (3.896%) had moderate training needs, while the respondents from the reading and writing category reached the highest The percentage of those with great training needs (13.636%) and the lowest percentage of those with few needs (5.844%) and the respondents from the primary category reached the highest percentage of those with great training needs (9.909%) and the lowest percentage Of those with medium training needs (7.142%) and respondents from a medium category, the highest percentage of those with large training needs (7.142%) and the lowest percentage of medium training needs (4%..545) The respondents from the middle school category had the highest percentage of significant training needs (3.986%) and the lowest percentage of moderate training needs (1.298%) Of the overall category, the highest percentage of intermediate training needs was (1.948%) and the lowest percentage was (1.298%), and of the higher category respondents, the highest percentage was reached For medium and small training needs (% 1.298) and the lowest percentage of training needs (% 0.649), as shown in Table (12)

Table (5) Distribution of respondents according to their educational levels and their relationship to their training needs in the field of irrigation water rationalization

rc value	X Calculated value	little need (57-203)		Medium NEED (204-214)		great need (215-228)		the need to train
		%	repetition	%	repetition	%	repetition	level of education
** moral 0.413	310.922	4.545	7	3.896	6	5.844	9	mother
		5.844	9	9.090	14	13.636	20	Reads & Writes
		7.792	12	7.142	11	9.090	14	primary
		5.844	9	4.545	7	7.142	11	medium
		2.597	4	1.298	2	3.896	6	prep



								institute
		1.298	2	1.948	3	1.298	2	faculty
		1.298	2	1.298	2	0.649	1	high
		29.221	45	29.431	45	41.558	64	total

0.2565=0.01 0.1966=0.05 Tabular value (rc): at a significant level

The correlation between training needs and the level of education investigated used the compatibility coefficient (rc) and its value reached (0.413), which is significant at the level of (0.01). Thus, we reject the hypothesis of non-existence and accept the alternative that states: The existence of (a statistically significant correlation between training needs and level of education). This may be due to the fact that farmers with higher levels of education are often more willing to participate in courses Training because they possess the information and knowledge that enable them to benefit from training while farmers The less educated are more interested in training programs and courses that focus on their acquisition of knowledge and skills. Therefore, with increased education, training needs change.

3- Possession of irrigation systems: The categories of respondents were classified according to their possession of irrigation systems according to the ranks shown in Table No.(13), where it is clear from the table that the highest percentage (11.038%) of respondents do not possess For the irrigation system, they are those with few training needs, and the lowest percentage (5,844) of those with significant training needs, and the highest percentage of respondents who own more than one irrigation system (15,337%) are those with Low training needs and the lowest percentage of respondents who have more than one irrigation system (12.337%) have moderate training needs, and respondents who have more than one irrigation system reached the highest percentage For small needs (17.532%) and the lowest percentage for medium training needs, which amounted to (8.441%), as shown in Table (13).

Table (6) Classification of respondents according to the variable of possession of irrigation systems

rc value	X Calculated value	little need (57-203)		Medium NEED (204-214)		great need (215-228)		the need to train
		%	repetition	%	repetition	%	repetition	Possession of irrigation systems
		11.038	17	6.493	10	5.844	9	undocumented



** moral 0.213	7.359	15.584	24	12.337	19	13.636	21	Owner of one system.
		17.532	27	8.441	13	9.090	14	Owner of more than one system
		44.156	68	27.273	42	28.571	44	total

0.2565=0.01 0.1966=0.05 Tabular value (rc): at a significant level

It is not possible to find a correlation between training needs and possession of irrigation systems. The compatibility factor (rc) was used and its value reached (0.213), which is significant at the level of (0.05). Thus, we reject the null hypothesis and accept the alternative that It states (there is a statistically significant relationship between training needs and tenure for the irrigation system). The reason for this may be that the correct use of the irrigation system by farmers contributes to reducing quantities Water that is used for irrigation, regardless of their possession of one or more irrigation systems. This means that ownership or possession of the systems used for irrigation is linked to the needs of farmers for training.

4- Type of irrigation machine: The categories of respondents were classified according to the variable type of irrigation machine according to the ranks shown in Table No.(14), where it is clear from the table that the highest percentage of the sprinkler irrigation category (8.441%) are those with special needs The few training and lowest percentage for the sprinkler irrigation category (5.844%) are those with large and medium training needs, and the highest percentage for the drip irrigation category was (22.727%) for those with large training needs and the lowest percentage for the irrigation category Drip (16.883%) for those with few training needs, while the highest percentage in the bubble irrigation category was (9.090%) for those with great training needs and the lowest percentage in the bubble irrigation category (3.896%) for those with few training needs, this agree with (6) (7) as shown in Table (14)

Table (7) Classification of respondents according to the variable type of irrigation machine used

rc value	X Calculated	little need (57-203)	Medium NEED (204-214)	great need (215-228)	the need to train
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	value	%	repetition	%	Repetition	%	repetition	Type of irrigation machine
** moral 0.403	29.92	8.441	13	5.844	9	5.844	9	spray irrigation
		16.883	26	22.077	34	22.727	35	drip irrigation
		3.896	61	5.194	8	9.090	14	Bubble irrigation
								few other
		29.220	45	33.118	51	37.662	58	total

0.2565=0.01 0.1966=0.05 Tabular value (rc): at a significant level

It is not possible to find a correlation between training needs and the type of irrigation machine. The compatibility factor (rc) was used and its value reached (0.403)**, which is significant at the level of (0.01). Thus, we reject the null hypothesis and accept the alternative that states (There is a statistically significant relationship between training needs and the type of irrigation machine. The reason for this may be that training needs are related to the irrigation method used by the farmer. this agree with (8) (9) For example, surface irrigation needs There is limited training compared to modern irrigation systems, such as drip irrigation, which require precise technical training because they require a deep understanding of how to adjust the systems and how to distribute water evenly, and thus abnormal consumption can occur Water efficient in case of misuse of irrigation machine.

6- The degree of farmers' awareness of the importance of rationalizing irrigation water: The respondents were classified according to the variable of the degree of farmers' awareness of the importance of rationalizing irrigation water into three categories using the theoretical range, where the lowest value was (8) and the highest value was (32) It was shown from Table (16) that the highest percentage (79.9%) are from the cognitive category to a large degree, and the lowest percentage (2.6%) are from the cognitive category to a small degree, as shown in Table (16).

Table (8) Classification of respondents according to the variable degree of farmers' awareness of the importance of rationalizing irrigation water



Sig	Correlation coefficient value Simplex (Pearson) (r)	percentage %	number	Categories of degree of farmers' awareness of the importance of rationalizing irrigation water	
0.01	**0.207	2.6	4	Low score (15-8)	The degree to which farmers realize the importance of rationalizing irrigation water
		17.5	27	Average score (23-16)	
		79.9	123	Great score (32-24)	
		%100	154	Total	

(0.01) moral at*

To find the correlation between the variable of the degree of farmers' awareness of the importance of rationalizing irrigation water and the training needs of vegetable farmers, then use the Pearson correlation coefficient, where its value reached a significant level(0.01) That is, there is a correlation between the two variables, and thus we reject the null hypothesis and accept the alternative, which states (there is a statistically significant relationship between training needs and the degree of farmers' awareness of the importance of rationalizing irrigation water) this agree with (10) (11) (12) The reason for this may be that farmers who need training are more aware of the importance of rationalizing irrigation water and rationing its use to prevent waste and loss of irrigation water.

Conclusions

Based on the results of the research, we conclude the following

- 1- Vegetable farmers have a major lack of knowledge in the field of rationalizing irrigation water due to farmers' lack of knowledge of how to ration the use of irrigation water and their lack of sufficient information in this field.
- 2- It turns out that the training needs are important for each area of irrigation water rationalization, so it is necessary to focus training in all the aforementioned areas, especially the field of means and methods of the agricultural drainage system Because they suffer from a significant lack of knowledge in this field, they are more in need of training in this field.It also shows that farmers need more information and experience related to the use of modern irrigation systems.
- 3- It was found that some independent factors have a weak correlation with the training needs of farmers in the field of irrigation water rationalization, which are (farm tenure - Rationalization of irrigation water, while it became clear that the variable of age - educational level - possession of irrigation systems - type of irrigation machine, degree of adequacy of irrigation water - degree of farmers' awareness of the importance of rationalizing irrigation water) is more needed and more relevant to farmers in the field of



rationalizing irrigation water extension activities implemented by the extension agency - training in the field

Recommendations

In light of the results and conclusions that resulted from the research, the researcher recommends the following

- 1- The extension training center must train farmers who use modern irrigation systems in the research area by holding training courses in all fields and according to priority.
- 2- Intensifying extension efforts to educate farmers about the use of modern irrigation systems.
- 3- Taking into account the topics in which farmers expressed their desire and enthusiasm to participate by the Extension Training Center and including them in the titles of training courses in the field of irrigation water rationalization.

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