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The Role of Agricultural Extension in Reducing the Negative Effects of the Lilan Cement Factory on Soil in Lilan Subdistrict / Kirkuk Governorate

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ABSTRACT
The research aimed to identify the role of agricultural extension in reducing the negative effects of the Laylan Cement Factory on soil from the farmers' point of view. It also sought to determine the level at which farmers apply certain agricultural practices to enhance soil health in the study area, examine the correlation between the level of farmers' application of these practices and various independent variables, and rank the soil health-enhancing agricultural practices based on their level of application by the respondents. To achieve the research objectives, a specially designed questionnaire was prepared consisting of three parts. The first part included a number of independent variables related to the respondents. The second part contained an (18) item four-point Likert scale to measure the role of agricultural extension. The third part featured a (16) item three-point Likert scale to assess the level of application of the practices. The research population included all farmers in the eight districts surrounding the Laylan Cement Factory, totaling 56 farmers. From this population, 16 farmers were randomly selected as a pilot sample (pre-test sample) and later excluded from the population of study. Thus, the final research sample consisted of 40 farmers.

The results showed that more than two-thirds of the respondents believe that the role of agricultural extension in reducing the negative impacts of the cement factory is weak. The findings also indicated that the level of farmers' application of certain agricultural practices to enhance soil health in the study area is moderate tending toward weak. Moreover, there was a statistically significant correlation between the level of farmers' application of soil health-enhancing agricultural practices and the variables of educational level, participation in training courses, and level of communication with information sources.

***Keywords*:** Role, agricultural extension, soil pollution, level of application.

INTRODUCTION

Soil is the cornerstone of life on Earth. It is the foundation of biodiversity, climate regulation, and agriculture-upon which humans rely to produce food and ensure food security. However, soil faces significant challenges in the era of massive industrial revolution and unregulated industrial expansion. Among these challenges are soil degradation, decreased fertility, and pollution caused by waste from various types of factories and industrial plants, particularly in nearby agricultural areas .This situation necessitates attention to soil, protecting it from pollution, or at least working to reduce the negative impacts of these industrial facilities. The most prominent negative effects of factories on soil include contamination with heavy metals, industrial waste, and chemical substances. These pollutants negatively affect soil fertility and the quality of crops grown, in addition to their broader impacts on the local environment and, ultimately, human health.

Agriculture plays a significant role in the Iraqi economy, particularly in terms of food production and animal feed. It also contributes to national income and provides the capital necessary for the sustainability of agriculture [1]. Since soil is one of the main elements of agricultural production and must be preserved, soil pollution has become an important issue that has gained considerable attention today. It has been the focus of international and local organizations as well as global conferences due to its negative impact on future agricultural activities [2].As a serious environmental problem, it requires the involvement and participation of all segments of society to confront it and reduce its harmful effects-it is a collective responsibility. Since humans are the primary cause of environmental pollution, they are also the first to suffer from it. Therefore, efforts must be made to develop their attitudes toward interacting with the environment, protecting it, and following sound practices to ensure that no harm is done to its components [3].

In the present era which is filled with numerous environmental challenges related to agriculture and the sustainability of environmental resources, the role of the agricultural extension system emerges as one of the main tools for enhancing knowledge and guidance in the fields of agriculture and the environment [4]. Agricultural extension also bears the primary responsibility for achieving agricultural and rural development by utilizing all available resources, providing information and knowledge across all aspects of life and transforming the ways of thinking knowledge skills and attitudes of rural communities[5].

Since soil is considered the foundation of traditional agriculture being the medium in which plants grow and providing both mechanical support and nutrients it not only serves as a rooting environment but also retains water and nutrients. This necessitates the implementation of a set of practices aimed at protecting the soil from pollution preserving its fertility and improving its productivity a concept known as soil management. Given this agricultural extension plays a vital role in improving soil management and conservation are achieved by raising farmers awareness of the importance of soil as a vital component of agricultural production and direct them toward practices that preserve soil fertility such as soil analysis balanced fertilization (including organic fertilization) crop rotation, erosion control techniques and smart farming. These practices enhance the sustainability of agricultural production through sound and appropriate management plans tailored to each soil type supported by training in modern techniques. This in turn reduces pollution and improves soil health [6]. Given the severity of the impacts caused by the Laylan Cement Factory on the agricultural sector in the region which negatively affect crop productivity potentially leading to a complete change in crop patterns the emergence of new pests and diseases and the collapse of existing crops thereby impacting farmers' incomes [7]. and in light of research indicating that the lack of agricultural extension services is a major external factor contributing to the excessive use of chemical inputs [8]. the agricultural extension system must play a greater role in mitigating these effects. It should adopt methods and approaches to help farmers adapt by educating and guiding them toward practices that protect the soil from pollution, Based on the above, the current research seeks to answer the following questions:

1.What is the role of agricultural extension in reducing the negative effects of the Laylan Cement Factory on soil?
2. What are the practices followed by farmers to maintain soil health?
3. what extent do farmers apply agricultural practices that enhance soil health?

Research Objectives:

1. To identify the role of agricultural extension in reducing the negative effects of the Laylan Cement Factory on soil from the farmers perspective.
2. To determine the level of farmers' application of certain agricultural practices to enhance soil health in the study area.
3. To identify the correlation between the level of farmers' application of soil health-enhancing agricultural practices and each of the following independent variables: age, educational level, farm size, type of land ownership, agricultural experience, participation in training courses, and level of contact with information sources.
4. To arrangement the agricultural practices that enhance soil health according to their level of application by the respondents.

Research Hypotheses:

There is no statistically significant correlation between the level of farmers application of certain agricultural practices to enhance soil health and any of the following independent variables:(age, educational level, farm size, type of land ownership, agricultural experience, participation in training courses, and level of communication with information sources).

Research Methodology:

The descriptive method was used, as it is considered appropriate for obtaining detailed data and facts about the phenomenon being studied at a specific point in time[9]. Moreover, the descriptive method is among the most widely used approaches in studying social phenomena. Accordingly this method is a suitable tool and approach for analyzing and describing the role of agricultural extension[10] in reducing the negative impacts of the cement factory on soil in the Laylan subdistrict / Kirkuk Governorate.

Research Population and Sample:

The research population included all farmers in the districts surrounding the Laylan Cement Factory, totaling eight districts with (56) farmers. A random sample of (16) farmers was selected as a survey sample (pre- test sample) and was later excluded from the main study population. Thus, the total study sample consisted of (40) farmers, as shown in Table (1).

Table (1): Research Population and Sample

District Name	Number of Farmers	Pre-test Sample	Study Sample
Rijban / 1	2	-	2
Targil / 2	2	-	2
Kawan Bawlan / 3	2	-	2
Tarklan / 4	4	1	3
Jadwa / 5	4	1	3
Qoraw / 6	22	7	15
Bayja'a / 11	9	3	6
Laylan / 28	11	4	7
Total	56	16	40

Data was selected from the Laylan Agricultural Division

Questionnaire Preparation:

To achieve the objectives of this part of the study, a specially designed questionnaire was developed consisting of three sections. The first section included a set of questions aimed at identifying some personal characteristics of the respondents, namely: (age, educational level, size of agricultural holding, experience in agriculture, type of land ownership, participation in training courses, membership in local organizations or associations, and level of contact with information sources).The second section contained a Likert type scale to measure the role of agricultural extension in reducing the negative effects of the cement factory. It consisted of (18) items, each followed by four response options: (Always, Sometimes, Rarely, and Does not perform, assigned) weights of (3, 2, 1, 0) respectively. The third section of the questionnaire also included a Likert type scale to measure the level of farmers application of certain agricultural practices aimed at enhancing soil health in the study area. This section consisted of (16) items, each followed by three response options: Always apply, Sometimes apply, and Do not apply, assigned weights of (2, 1, 0) respectively.

After completing the initial design of the questionnaire, a(validity) test was conducted. Validity refers to the degree to which the test measures the characteristic it was designed to measure [11]. The questionnaire was presented to several specialists in the field of agricultural extension to assess the clarity of its items and their suitability for the intended purpose this is known as face validity. It was also presented to experts in soil and environmental sciences to assess content validity, which refers to the extent to which the items of the scale align with the objective or content of the scale itself [12].Based on the feedback and observations from these specialists, some items were reworded, others were removed, and new items were added. To ensure the reliability and appropriateness of the scales used in the questionnaire, a (pre-test) was carried out on a random sample of (16) farmers, who were later excluded from the main study sample. This pre test aimed to verify the questionnaire's effectiveness in terms of question formulation, sequence, clarity, and identifying and addressing areas of difficulty. It also helped determine the time required for respondents to complete the questionnaire and calculate the reliability coefficients of the included scales.

To ensure the reliability and validity of the scales (the Agricultural Extension Role Scale and the Application Level Scale), the split-half method was used. The items of each scale were divided into two groups: the first group included the odd-numbered items, while the second group included the even-numbered items. The simple correlation coefficient between the two groups was calculated using Pearson's formula, representing half of the test. Then a correction was applied using the Spearman-Brown formula. A scale is considered reliable if the reliability coefficient exceeds (0.70) [13]. Afterward, the validity coefficient was obtained by taking the square root of the reliability coefficient. The results are shown in Table (2).

Table (2): Reliability and Validity Coefficients of the Scales Included in the Questionnaire

Type of Scale	Pearson Coefficient	Reliability Coefficient	Validity Coefficient
Role of Agricultural Extension	0.61	0.76	0.87
Level of Application	0.66	0.79	0.89

Measurement of Study Variables:

Measurement of Independent Variables:

1. Age: Measured by the respondent's age in years up to the time of data collection.
2. Educational Level: Measured using the following categories: Illiterate, Literate, Primary, Intermediate, Secondary, Diploma, Bachelor's, and Postgraduate. These were assigned weights of (1, 2, 3, 4, 5, 6, 7, 8) respectively.
3. Size of Agricultural Holding: Measured based on the area of land owned by the respondent, expressed in dunums.
4. Land Ownership: Measured using the categories: Owned, Contract, Rented, Shared, and Investment. These were assigned weights of (1, 2, 3, 4, 5) respectively.
5. Experience in Agriculture: Measured .5 by assigning a numerical value for each year the farmer has worked in agriculture.
6. Participation in Training Courses: Measured using two levels: Participated and Did not participate, assigned weights of (1,

2) respectively.

7. Level of Contact with Information Sources: Measured using a Likert-type scale consisting of 12 sources that the respondent may rely on to obtain information about protecting the soil from pollution. Each source had four response options: Always, Sometimes, Rarely, Do not rely, with assigned weights of (3, 2, 1, 0) respectively.

Measurement of Dependent Variables:

First: Dependent Variable - Role of Agricultural Extension:

A Likert type scale was used to measure the role of agricultural extension in reducing the negative impacts of the cement factory. The scale consisted of(18) items, each representing an activity that agricultural extension could implement or carry out to reduce negative impacts in the study area. Each item had four response options: Always, Sometimes, Rarely, Does not perform, assigned weights of (3, 2, 1, 0) respectively. Thus, the theoretical range of the scale is (0-54) points, where the total score of the respondent's answers to the scale items reflects the extent of the role played by agricultural extension.

Second: Dependent Variable - Level of Farmers' Application:

A Likert type scale was used to measure the level of farmers application of certain agricultural practices aimed at enhancing soil health in the study area. The scale consists of (16) items, each representing a practice that contributes to improving soil health. Each item was followed by three response options:(Always apply, Sometimes apply, Do not apply, assigned) weights of (2, 1, 0) respectively. Therefore, the theoretical range of the scale is (0-32) points, where the total score of the respondent's answers indicates the level of level of application.

Data Collection and Analysis:

After finalizing the questionnaire in its final form, the study data were collected through personal interviews with the respondents during the period from April 1, 2025, to May 8, 2025. Once the data collection process was completed, the data were organized, tabulated, and then analyzed using the SPSS (Statistical Package for the Social Sciences) software. Several statistical methods and techniques were employed, with the aim of summarizing the quantitative data collected by the researcher into a descriptive form that gives it meaning, followed by drawing certain conclusions from it[14]. Among these methods were: Arithmetic Mean ,Standard Deviation ,Pearson's Simple Correlation Coefficient, Spearman-Brown Coefficient ,Weighted Mean.

Results and Discussion:

1. Identifying the Role of Agricultural Extension in Reducing the Negative Effects of the Lailan Cement Plant on Soil from the Farmers' Perspective:

The study results showed that the highest degree obtained by the respondents according to the agricultural extension role scale was 34 degree, and the lowest degree was 12 , with a mean of 17.6 and a standard deviation of 5.7. The extension role was categorized into three levels based on the range and class length formula, and the results are presented in Table (3).

Table (3): Categories of the Role of Agricultural Extension in Reducing the Negative Effects of the Lailan Cement Plant on Soil from the Farmers' Perspective.

Categories of the Role of Agricultural Extension	Frequency	%	Arithmetic Mean	Standard Deviation
Low (12 – 18)	26	65	17.6	5.7
Moderate (19 - 25)	9	22.5		
High (26 or more)	5	12.5		
Total	40	100		

The above results indicate that more than two-thirds of the respondents believe that the role of agricultural extension in reducing the negative impacts of the cement plant is weak, with 65% of the farmers stating this opinion. Meanwhile, 22.5% of the respondents reported that the extension role in this area is moderate, and 12.5% considered the extension role to be strong. These findings point to the weakness of agricultural extension in mitigating the negative effects of the cement plant on soil in the study area .

This calls for the relevant authorities to take the issue seriously and conduct intensive training courses and extension campaigns in the study area to raise awareness among farmers and their families on how to protect the soil from pollution and reduce the negative impact of the cement plant on soil. The results of the current study indicate significant soil contamination with major elements. This finding is consistent with the study by [8], but it does not align with the studies by [15 and [16].

2. Determine the level of farmers' application of certain agricultural practices to enhance soil health in the study area:

To determine the level of farmers' application of certain agricultural practices aimed at enhancing soil health in the study area, a Likert-type scale was used consisting of 16 items representing agricultural practices that, when applied, contribute to improving soil health. The respondents scored a maximum of 24 points on this scale, while the minimum score was 10 points, with a mean of 17.3 and a standard deviation of 3.7. The level of implementation was classified into three categories based on the respondents' scores using the range and class interval formula. The results are presented in Table (4).

Table (4): Categories of Farmers' application Level of Certain Agricultural Practices to Enhance Soil Health.

Categories of application Level	Frequency	%	Arithmetic Mean	Standard Deviation
Low (10 – 14)	12	30	17.3	3.7
Moderate (15 – 19)	19	47.5		
High (20 – 24)	9	22.5		
Total	40	100		

The results in Table (4) indicate that 47.5% of the respondents had a moderate level of implementation of certain agricultural practices aimed at enhancing soil health in the study area while 30% of the respondents implemented these practices at a low level. Those who applied these practices at a high level constituted 22.5%. These findings suggest that the level of farmers' implementation of some agricultural practices to enhance soil health in the study area is moderate tending toward low, as the combined percentage of the two lower categories reaches 77.5%. This may be attributed to the weak role of agricultural extension in this field, and the fact that farmers still need more information and skills related to proper agricultural practices that promote soil health.

3. Determining the correlation between the level of farmers' application of certain agricultural practices to enhance soil health and each of the following independent variables: age, educational level, size of farm holding, type of land tenure, farming experience, participation in training courses, membership in organizations, and level of contact with information sources .

1. Age: The research results showed that the oldest respondent was 65 years old, and the youngest was 27 years old. The respondents were categorized into three age groups, as shown in Table (5). The results indicate that half of the respondents were older adults, while the percentage of respondents in the middle and younger age groups combined was 50%. To determine the correlation between the level of application and the age variable, Pearson's correlation coefficient was used, and its value was found to be (- 0.108), which is not statistically significant. Therefore, the null hypothesis is accepted.

2. Educational Level : The respondents were distributed according to this variable into seven categories, as shown in Table (5). The results revealed that the highest percentage of respondents were in the "primary education category, accounting for 35%, followed by those with a bachelor's degree at 22.5%. There were no illiterate respondents. To determine the correlation between the level of implementation and the educational level variable, Spearman’s correlation coefficient was used. The result was (0.364), which is statistically significant at the 0.05 probability level. This indicates a significant correlation between the two variables, thus the null hypothesis is rejected and the alternative hypothesis is accepted. This may be due to the fact that none of the respondents were illiterate; rather, all had varying educational levels that qualify them to acquire more knowledge about agricultural practices that contribute to maintaining soil health, thereby improving their ability to understand, absorb, and apply these practices .

3. Farm Holding Size : The respondents were divided into three categories based on this variable, as shown in Table (5). The results indicate that 42.5% of the respondents owned large farm holdings ranging from 70 to 100 dunums, which are considered suitable areas for cultivation, while 27.5% had small-sized holdings. To determine the correlation between the level of application and the size of farm holding, Pearson's correlation coefficient was used, and its value was (-0.136), which is not statistically significant. Therefore, the null hypothesis is accepted, which states that there is no statistically significant correlation between the level of implementation and the size of farm holding.

4. Type of Land Tenure : The respondents were classified into four categories based on this variable, as presented in Table (5). The results showed that more than half of the respondents (55%) held their land under contractual agreements, while only 27.5% owned their land (freehold). To determine the correlation between the level of application and the type of land tenure, Pearson's correlation coefficient was used, and its value was (0.082), which is not statistically significant. Thus, the null hypothesis is accepted, indicating that there is no statistically significant correlation between the level of implementation and the type of land tenure.

5. Experience in the field of agriculture : The respondents were divided according to this variable into three categories as shown in Table (5). The results indicated that 45% of the respondents had little experience in agriculture, while 22.5% of them had extensive experience. To determine the relationship between the level of application and this variable, Pearson's correlation coefficient was used, and its value was 0.072, which is not statistically significant. Therefore, the null hypothesis - stating that there is no statistically significant correlation between the level of application and experience in agriculture is accepted.

6. Participation in training courses: The respondents were classified according to this variable into two categories, as shown in Table (5). The results revealed that more than half of the respondents had participated in training courses, with 55% having participated, while 45% had not. To determine the correlation between the level of application and participation in training courses, Pearson's correlation coefficient was used, and its value was 0.333, which is significant at the 0.05 probability level.

Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted. This may be attributed to the fact that farmers acquired knowledge and information through their participation in training courses, which enhanced their level of application of agricultural practices that preserve soil health.

7. Level of communication with information sources: The respondents were categorized according to this variable into three groups as shown in Table (5). The results showed that more than half of the respondents had a moderate level of contact with information sources, accounting for 57.5%, while those with a high level of contact represented 22.5%. This indicates that the respondents' level of communication with information sources is moderate tending toward high. To examine the correlation between the level of application and the level of communication with information sources, Pearson's correlation coefficient was used, and its value was 0.367, which is statistically significant at the 0.05 probability level. Accordingly, the null hypothesis is rejected and the alternative hypothesis is accepted. This may be due to the fact that through contact with various information sources, respondents gained awareness of agricultural practices that help preserve soil health, which in turn encouraged them to implement these practices.

Table (5): Distribution of respondents according to independent variables and their correlation with the level of farmers' application of certain agricultural practices to enhance soil health.

Variables	Categories	Frequency	%	Arithmetic Mean	Standard Deviation	Pearson Correlation Coefficient	Spearman Correlation Coefficient
Age	Young (27 – 39)	7	17.5				
	Middle-aged (40 – 52)	13	32.5	50.5	11.2	− 0.108 N.S	
	Old (53 − 65)	20	50				
Total		40	100				
Educational Level	Reads & Writes	2	5				
	Primary	14	35				
	Intermediate	7	17.5				
	Secondary	5	12.5				0.364*
	Diploma	2	5				
	Bachelor's	9	22.5				
	Postgraduate	1	2.5				
Total		40	100				
Farm Size	Small (10 – 39)	11	27.5				
	Medium (40 – 69)	12	30	57.9	29.9	− 0.136 N.S	
	Large (70 – 100)	17	42.5				
Total		40	100				
Type of Land Tenure	Owned	11	27.5				
	Rented	22	55				0.082 N.S
	Partnership	4	10				
	Endowment	3	7.5				
Total		40	100				
Years of Experience in Agriculture	Low (10 – 21)	18	45				
	Medium (22 – 33)	13	32.5	25.27	11.25	0.072 N.S	
	High (34 – 45)	9	22.5				
Total		40	100				
Participation in training Participated courses	Participated	22	55				0.333*
	Did not Participated	18	45				

Total		40	100			
Communication with information sources	Low (9 – 12)	8	20	14.07	2.75	0.367*
	Medium (13 – 16)	24	57.5			
	High (17 – 20)	9	22.5			
Total		40	100			

Significant at the 0.05 probability level; N.S = Not Significant

4. Arrangement of agricultural practices that enhance soil health according to their level of application by the respondents:

The results, as shown in Table (6), indicated that the top three agricultural practices in terms of application-based on the weighted arithmetic mean-were : Tilling the soil to improve aeration and enhance water and nutrient absorption with a weighted mean of (2), Reducing the use of chemical fertilizers with a weighted mean of (1.85), and Irrigating according to the plant's needs with a weighted mean of (1.83), respectively.

On the other hand, the bottom three practices were: Using a digging plow every five years to break the hardpan layer in the soil with a weighted mean of (0.65), Covering the soil with polyethylene (plastic) sheets to prevent pollutants from settling on it with a weighted mean of (0.50), and Adding agricultural gypsum to improve soil fertility and increase aeration with a weighted mean of (0.23).

Table (6) shows the arrangement of agricultural practices that lead to enhancing soil health according to the level of their application by the respondents.

N	Agricultural Practices	Weighted Average	Rank
1.	Tilling the soil to improve aeration and enhance water and nutrient absorption	2	1
2.	Reducing the use of chemical fertilizers	1.85	2
3.	Using organic fertilizers to increase soil organic matter	1.25	7
4.	Mulching the soil with grass or organic materials (plant residues) to prevent pollutants from falling onto the soil	0.95	11
5.	Covering the soil with nylon (polyethylene) to prevent pollutants from falling onto the soil	0.5	15
6.	Reducing the use of agricultural pesticides	1.2	8
7.	Using modern irrigation methods	1.75	4
8.	Irrigating according to the plant's needs	1.83	3
9.	Applying crop rotation	1.68	6
10.	Using cover crops (such as planting temporary crops that are not harvested, like alfalfa or grains)	0.88	12
11.	Planting leguminous crops, especially winter legumes	0.7	13
12.	Adding agricultural gypsum to improve soil fertility and increase aeration	0.23	16
13.	Planting crops capable of absorbing pollutants from the soil, such as corn and sunflower	1.03	10
14.	Periodic soil analysis	1.05	9
15.	Rotating different crops on the same land	1.7	5
16.	Using a digging plow every five years to break the hardpan layer in the soil	0.65	14

Conclusions

Based on the findings of the study, the following conclusions can be drawn :

1. There is a weak role of agricultural extension in reducing the negative impacts of the cement factory on the soil in the study area.
2. The level of farmers' application of agricultural practices that enhance soil health in the study area is moderate tending

toward low.

3. There is a statistically significant correlation between the level of farmers' application of soil health-enhancing agricultural practices and the variables of educational level, participation in training courses, and level of contact with information sources.
4. There is no statistically significant correlation between the level of farmers' application of soil health-enhancing agricultural practices and the variables of age, farm holding size, type of land tenure, and experience in the agricultural field.
5. Certain agricultural practices ranked among the top three in terms of application, namely. Tilling the soil to improve aeration and enhance water and nutrient absorption. Reducing the use of chemical fertilizers, and

Using organic fertilizers to increase soil organic matter, respectively On the other hand, other practices ranked among the lowest, such as Periodic soil analysis, Crop rotation in the same land, and Crop rotation in the same land, and Crop rotation in the same land, and Using a subsoiler (chisel plow) every five years to break the compacted (hardpan) soil layer .

Recommendations

1. The relevant authorities should activate the role of agricultural extension in the study area by enhancing its function and expanding its responsibilities through the development of targeted plans and programs to guide farmers and their families in the management and protection of soils from pollution .
2. Farmers in the study area should be guided and advised on the importance of applying agricultural practices that enhance soil health through training courses focused on this field, with an emphasis on the practices that ranked lowest in terms of application .

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دور الارشاد الزراعي في التقليل من الاثار السلبية لمعمل اسمنت ليلان على التربة في ناحية ليلان/ محافظة كركوك

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الخلاصة

استهدف البحث التعرف على دور الارشاد الزراعي في التقليل من الاثار السلبية لمعمل اسمنت ليلان على التربة من وجهة نظر الفلاحين فضلاً عن التعرف على مستوى تطبيق الفلاحين لبعض الممارسات الزراعية لتعزيز صحة التربة في منطقة الدراسة، ودراسة العلاقة الارتباطية بين مستوى تطبيق الفلاحين لبعض الممارسات الزراعية لتعزيز صحة التربة والمتغيرات المستقلة ، وترتيب الممارسات الزراعية لتعزيز صحة التربة من حيث تطبيقها من قبل المبحوثين، ولغرض تحقيق أهداف البحث تم اعداد استبانة خاصة تتكون من ثلاثة اجزاء تضمن الجزء الأول على عدد من المتغيرات المستقلة ذات العلاقة بالمبحوثين، أما الجزء الثاني فقد تضمن على مقياس من نوع ليكرت الرباعي لقياس دور الارشاد الزراعي يحتوي على (18) فقرة، فيما تضمن الجزء الثالث على مقياس اخر من نوع ليكرت الثلاثي لقياس مستوى التطبيق يحتوي على (16)، شمل مجتمع البحث جميع الفلاحين في المقاطعات المحيطة بمعمل إسمنت ليلان البالغ عددها (8) مقاطعات وبلغ عدد الفلاحين فيها (56) فلاحاً ، تم اختيار (16) فلاحاً عشوائياً كعينة استطلاعية (عينة الاختبار الأولي) وتم استبعادهم لاحقاً من مجتمع الدراسة وبذلك بلغ اجمالي عينة الدراسة (40) فلاحاً.

أظهرت النتائج أن أكثر من ثلثي المبحوثين يرون بأن دور الارشاد الزراعي في التقليل من الآثار السلبية لمعمل الاسمنت دور ضعيف، كما بينت النتائج ان مستوى تطبيق الفلاحين لبعض الممارسات الزراعية لتعزيز صحة التربة في منطقة الدراسة متوسط يميل الى ضعيف، وأن هناك علاقة ارتباط معنوية بين مستوى تطبيق الفلاحين للممارسات الزراعية التي تعزز من صحة التربة وكل من المتغيرات (المستوى التعليمي، المشاركة في الدورات التدريبية، ومستوى الاتصال بمصادر المعلومات).

الكلمات المفتاحية: الدور، الارشاد الزراعي، تلوث التربة، مستوى التطبيق.