



## The role of the agricultural extension in educating farmers about the legislation on protecting the environment from pollution with chemical pesticides

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### Abstract

The research aimed to determine the role of the agricultural extension in educating farmers about the legislation on the protection of the rural environment from pollution with chemical pesticides working in the Department of Agricultural Extension and Training and the Department of Agricultural Extension in the directorates of agriculture of Najaf and Qadisiyah, and to determine the role of the agricultural extension in the axis of farmers' use of the correct methods to protect the rural environment from pollution with chemical pesticides and the axis of the reasons that lead farmers to pollute the rural environment with chemical pesticides, and to achieve the objectives of this research prepared A questionnaire in the light of reviewing the relevant literature, legislation, laws and guidance bulletins, consisting of (72) items distributed on (3) axes, namely, the role of the agricultural extension in educating farmers about the legislation on protecting the rural environment from chemical pesticide pollution, the axis of the role of the agricultural extension in the use of farmers the correct methods to protect the rural environment from pesticide pollution, and the axis of the reasons that lead farmers to pollute the rural environment with pesticides, data were collected during the months of July and August / 2022 by the questionnaire in a personal interview method from a random sample by (100) by (60)

agricultural extension, and the results of the research showed that the rate of the role of the agricultural extension in educating farmers about the legislation on environmental protection, The workers in the Department of Agricultural Extension and Training and the agricultural extension departments in the directorates of agriculture of Najaf and Qadisiyah amounted to (58.9 degrees and that the highest percentage was (60%) and falls within the category of the large role , and the results also showed a large role tends to the average in the axis of farmers' use of the correct methods to protect the rural environment from chemical pesticide pollution by (46.7%), The results showed a medium role tends to weak in the axis of the reasons that lead farmers to pollute the rural environment with chemical pesticides by (45), the researchers recommend the adoption of this study by the Ministries of Agriculture and Health and Environment and the need to pay attention to the issue of protecting the rural environment from pollution with chemical pesticides by expanding the scope of training courses, extension seminars and printing guidance bulletins related to this topic to increase and strengthen the role of agricultural extension workers in this field.

**Key words:** Agricultural Extension, Educating Farmers, chemical pesticides

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## Introduction

Chemical pesticides are one of the most important sources of environmental pollution, as humans have resorted to using them to reduce pest damage [1], the excessive and indiscriminate use of these pesticides, repeated spraying against pests and non-compliance with the recommended dose led to an increase in environmental pollution, killing vital enemies [2] and disturbing the natural balance between pests and their vital enemies, and turning some pests from secondary pests to major pests [3] Accordingly, there are many sources of pollution of the environment with various pesticides [4] and these sources include:

- Frequent use and circulation of pesticides randomly without knowledge and knowledge of their information, as well as non-compliance with the recommended dose by the producing companies.
- The use of pesticides that are prohibited for use locally and internationally and

cause severe damage and destruction to the environment.

- Emergency or sudden cases in which pesticides are spread in the environment due to leakage or explosions of pesticides during manufacture, storage, transportation or use, which leads to many disabilities and chronic diseases.
- Old pesticides that were not used in their time become an environmental problem because it is difficult to continue to store or dispose of them easily.

Studies also indicate that the problems related to the use of pesticides are: (Pesticide Use Manual: 20)

- 1-The occurrence of health problems for those in charge of the use process in the field, especially in the event of non-compliance with the terms of safe use.
- 2-Damage to the environment and the accumulation of pesticides in the soil and water.
- 3-Impact on non-target organisms including beneficial insects, farm animals, aquatic

revivals such as fish and biological enemies).

- 4-Adverse health effects of pesticide residues on crops.
- 5-The emergence and growth of the pesticide resistance trait in pests.

Accordingly, the need for clean agriculture that limits the use of pesticides and reliance mainly on integrated pest management [5] , which leads to healthy and sound growth of the crop with the least possible impact on the environment through the mechanisms of natural plant resistance to the pest and the integration of control methods to reduce the damage and spread of the pest and thus legalize the use of pesticides to the lowest possible extent, thus transferring health risks to humans, animals and the environment in general [6] .

In view of the importance of integrated management in creating a clean environment, it requires increasing the awareness of the agricultural extension of the mechanisms of its use, including [7] .

- 1- Adoption of the principle of economic critical reduction in control
- 2- Damage of pesticide residues to health and the environment.
- 3- The degree of toxicity it causes.
- 4- Chemical pesticide metabolism processes and their importance in agricultural pest control.
- 5- Safe use of it
- 6- Skills required for optimal use of sprinkler devices.
- 7- Protecting the environment through multiple means, the most important of which are laws related to the circulation of chemical pesticides and environmental legislation.

The agricultural extension plays an important role in preserving natural resources and protecting the environment, and is the main pillar of the success of extension work and the link between two social systems, the extension organization to

which it belongs and the external organization represented by the agricultural public, through its daily and direct presence with them[8] , as it provides Extension by information and technical expertise to help them make sound decisions in solving the problems they suffer from in all aspects, including environmental pollution [9] , which means the presence of pollutants affecting the environment in quantity, concentration or unnaturally that lead directly or indirectly to harm humans and other living organisms and the non-living components that exist in them.[10] .

What ... The role of the agricultural extension in preserving the environment is essential in establishing inter-awareness and promoting sustainable agriculture, which is supposed to be broad and large, by educating and encouraging researchers to develop products and transfer more environmentally friendly production methods, as well as introducing the types and quantities of safe chemical pesticides, encouraging integrated management mechanisms for agricultural pests, using infestation-resistant varieties and encouraging organic agriculture to reduce the use of pesticides [11] . Environmental awareness is "recognizing and sensing inter-problems and searching for ways to solve them" [12] .

Studies emphasize the importance of the environment and the need to preserve it and reach effective solutions to environmental problems based on environmental awareness [13] [14] [15] [16] and focusing on the media in its various means in crystallizing and spreading environmental awareness [12] , leading to farmers' awareness of their role in confronting the environment [17] , through the objective and honest translation of environmental news and facts, and providing farmers with them in a way that helps them to form a correct opinion regarding environmental issues , So that the

goal of environmental media is to educate the public and decision-makers on the importance of preserving the environment, through the proper personal dealing of individuals and groups with the natural environment, and the quality of farmers does not stop at simply urging them to work individually, most of that goes beyond that to provide them with knowledge and motivations to form a public opinion that respects the environmental system and pressures decision-makers to adopt integrated development plans. Environmental media is an essential link for crystallizing and shaping awareness about environmental issues and problems, but efforts must be concerted from education and inter-education to mass media so that the desired goals and objectives can finally be achieved and the ways of guidance and inter-awareness can be achieved [12].

The agricultural extension worker's coordination and cooperation skills are crucial in influencing the extension process, through his focus on collaborative work among extension workers. [18] as well as coordination between extension institutions in the public sector to develop extension programs for environmental awareness and work on sustainable development and the adoption of environmentally friendly technologies [11].

Non-governmental organizations play an important role in public awareness on a large scale locally, regionally and internationally, as they contribute effectively to spreading environmental awareness among decision-makers, political leaders and the agricultural public, and measures to address pollution problems, and trying to show the negative impact of economic development at the expense of the natural environment [13]. Laws are one of the means to achieve the goal of protecting the environment, and they alone cannot achieve the desired purpose in this area if they are

not based on public awareness and awareness that reaches the conscience of man and turns into positive social values and controls of behavior that lead to the preservation of the environment [9]. At the legislative level, Iraq was interested in the environment and the development of the necessary legal provisions for this purpose, and these provisions and legislation included instructions and environmental determinants in force and punitive and penal provisions, in line with the magnitude of the inter-damage and its elimination, and its effects and the identification of a specific and clear mechanism for legal follow-up and the transfer of environmental authorities some powers in this aspect [7].

However, one study pointed to the main reasons behind the increase in environmental degradation [19]:

- 1-The absence of a formal role and the lack of an appropriate strategy for its development.
- 2-Failure to activate deterrent laws in case of encroachment on the environment.
- 3-Not giving the environment the required priority through the programs and services provided by the guidance body.
- 4-Poor coordination between relevant institutions.
- 5-Wrong agricultural practices.
- 6-Lack of participation of farmers in the planning of environmental extension programs.
- 7-Weak participation of agricultural extension workers and farmers in planning, implementing and evaluating environmental extension programs.
- 8-Farmers do not benefit from the assistance provided to protect the environment.

Due to the importance of this topic, this research came to answer the following questions:

- 1- What is the role of the agricultural extension in educating farmers about the

legislation on the protection of the rural environment from pollution with chemical pesticides?

- 2- What are the correct methods used by the agricultural guide to protect the environment from pollution?
- 3- What are the reasons that lead farmers to pollute the rural environment with chemical pesticides?

#### **The Aims Of Study**

- 1-Determining the role of the agricultural extension in the quality of farmers in legislation on the protection of the rural environment from pollution with chemical pesticides.
- 2-Identify the correct methods that are used to protect the rural environment from pollution.
- 3-Identify the causes that lead farmers to pollute the rural environment with chemical pesticides.

#### **Research hypothesis:**

- 1- There is a weakness in the role of the agricultural guide in raising awareness of the legislation related to protecting the environment from pollution with chemical pesticides.
- 2- There is a weakness in the role of the agricultural guide by identifying the correct methods used to protect the rural environment from pollution.
- 3- There is a weakness in the role of the agricultural guide by identifying the causes that lead farmers to pollute the rural environment with chemical pesticides.

#### **Materials And Methods**

In conducting this research, he relied on the descriptive approach using the method of survey studies because it is commensurate with the nature of the phenomenon to be studied, which is to determine the role of the agricultural extension in educating farmers about the protection of the environment from pollution with chemical pesticides.

#### **Study area**

Baghdad/Najaf/ Qadisiyah from Iraq were selected as areas to conduct the research.

#### **Study community and samples**

The research community included:

- 1- The governorates of the central region of Iraq, which numbered (8 governorates), Then a random sample was taken 40% and by 3 governorates: (Baghdad, Najaf, Qadisiyah)
- 2- Agricultural extension working in the agricultural extension and training department, which is (94) agricultural extension, and a random sample was selected by 64% by (60) extension.

#### **Preparing the research questionnaire**

The questionnaire was used as a main tool to collect data from the respondents, as the questionnaire is one of the good means through which information, data and facts can be obtained, being more objective than other methods of data collection to achieve the objectives of the research [20] , as the questionnaire included a measure of the role of agricultural extension in raising awareness of legislation on the protection of the rural environment from pollution with chemical pesticides, the process of preparing the questionnaire went through a series of stages, as follows:

**The first stage:** The questionnaire was prepared in its initial form in the light of the literature on chemical pesticides and legislation on the protection of the rural environment from pollution, which consisted of (72) items distributed over (3) axes: The axis of the role of the agricultural extension in the quality of farmers in the legislation on the protection of the rural environment from pollution with chemical pesticides and included (26) items and the axis of the correct methods that are used to protect the rural environment from pollution and includes (25) items and the axis of the reasons that lead farmers to pollute the rural environment with chemical pesticides and ensure 21 items.

## Second Stage: Questionnaire

**Development:** To ensure the validity of the questionnaire questions, the axes and items of the scale were presented to experts and specialists in the field of agricultural extension and chemical pesticides in order to identify the degree of their approval of their content and the amendments required to come out with their final version before presenting them to the respondents in the light of the approval scale consisting of (3) levels: OK, OK Agree with modification, not Agree.

**The third stage is determining the cutting threshold:** The cutting threshold is the degree to which the axis and paragraph should achieve in the average scores of expert approval, and the cutting threshold has been determined by (75) or more than the degree of approval of experts, as the coefficient of validity of the tool is acceptable if the agreement on the tool is obtained by (75) or more of experts [21].

## Fourth stage Calculation of the average scores of expert approval of the

Table (1) Distribution of axes and items of the scale of the role of the agricultural extension in raising awareness of legislation on the protection of the rural environment from pollution by chemical pesticides.

Axles	Number of items	%
The role of the agricultural extension in educating farmers about the legislation on protecting the environment from pollution with chemical pesticides	26	36.1
The role of the agricultural extension in the use of farmers the correct methods to protect the rural environment from pollution with chemical pesticides	25	34.8
The role of the agricultural extension in the causes that lead farmers to pollute the rural environment with chemical pesticides.	21	29.1
Total	72	100

## Measure The Stability Of The Resolution

Stability is the tool if repeated twice gives the same results or is the degree of internal consistency of the items and is conducted on the respondents outside the original sample [22]. To measure the stability of the resolution, a preliminary test

## components of the questionnaire:

Determine the weight (numeric value) of each statement in the expert approval scale on the axes and items as follows: [(2) The score of the statement OK (1) The score of the statement OK with the amendment (0) zero for the statement disagree and the averages were calculated by calculating the total scores obtained on the number of experts.

**Fifth stage Preparation of the questionnaire in its final form:** In light of comparing the averages of the degrees of approval of experts on the axes and items of the questionnaire with the threshold of cutting to prepare the

questionnaire in its final form, all axes and items have achieved the threshold of cutting or more, as it reached to measure the role of the agricultural extension (83.3%) Thus, all axes and items remained as shown in Table (1)

was conducted for it Pre-test on a sample of (10) agricultural extension randomly selected outside the original sample has been used method of half segmentation and the rate of stability of the scale of the role of the agricultural extension by applying Spearman-Brown Law (0.82) which is a

high stability coefficient, It is a high stability coefficient, which indicates that the stability of the counselors' answers to the items is good, then the validity coefficient was calculated by extracting the square root of the stability coefficient, so its value was (0.90) and therefore our values of stability and validity are scientifically acceptable and the stability coefficient is acceptable if its value is higher than (0.75) [22] .

#### Data collection.

The data was collected by questionnaire through a personal interview with agricultural extension workers during the months of August and September / 2022.

#### Data Analysis

After completing the data collection process and then unloading the questionnaires to analyze the research data and process them statistically, the process of tabulating and analyzing the data of the three axes was completed, namely: The role of the agricultural extension in the quality of farmers in the legislation on protecting the environment from pollution with chemical pesticides, which includes (26) items, and the axis of the correct methods used to protect the rural environment from chemical

pesticide pollution, which includes (25) items, and the axis of the reasons that lead farmers to pollute the rural environment with chemical pesticides, which includes (21) items, and the category of respondents to (3) categories in each of the three axes.

and the most important statistical methods used in the research are: percentage, arithmetic mean, standard deviation, Spearman-Brown equation and validity coefficient.

#### Results And Discussion

The first objective: the role of the agricultural extension in educating farmers about the legislation on the protection of the rural environment from pollution by chemical pesticides.

The results of the research showed that the role of the agricultural extension ranged between (19-51) degrees at a rate of (58.9) degrees and a standard deviation of (14.5) on a scale whose theoretical range reached (0-52) degrees and the number of items (26) items and the respondents were classified according to their role into (3) categories (weak - medium - large) as in Table (2):

Table 2 - Distribution of respondents according to their role in raising awareness of legislation on the protection of the rural environment from pollution by chemical pesticides

Categories	Grade Categories	Number	%	Arithmetic mean for each category	Observations
Weak	19 – 29	8	13.3	31.6	Sd= 14.5
Medium	30 – 40	16	26.7	50.4	$\bar{x}$ = 58.9
big	41 -51	36	60	68.7	N= 60

The above table shows that the highest percentage of (60%) of the research sample falls within the category of the large role at a rate of role (68.7) degrees, followed by the category of the middle role (26.7%) and the

rate of role (50.4) degrees and that the lowest percentage was (13.3) falls within the category of weak role at a rate of (31.6)

degrees, it follows from this that a little more than half of the respondents describe their role in raising awareness of legislation on the protection of the rural environment from pollution with chemical pesticides Balkier tends to medium and may be attributed to Agricultural extension workers are aware of these legislations to some extent by contacting specialists in this field and acquiring information from them or by

reading them in the official gazette in which laws and legislations are published.

**Second Objective: The role of the agricultural extension in the use of farmers the correct methods to protect the rural environment from pollution with chemical pesticides**

The results of the research showed that the role of the agricultural extension ranged

between (11-50) degrees at a rate of (35.7) degrees and a standard deviation of (9.4) on a scale whose theoretical range was zero - 50) degrees and the number of items (25) items and the respondents were classified according to their role into (3) categories (weak - medium - large) as in Table 3.

Table 3 Distribution of respondents according to their role in farmers' use of the correct methods to protect the rural environment from pollution by chemical pesticides

Categories	Grade Categories	Number	%	Arithmetic mean for each category	Observations
Weak	11 – 23	6	10	17.6	Sd= 9.4
Medium	24 – 36	26	43.3	31.2	$\bar{x}$ = 35.7
big	37 – 50	28	46.7	43.8	N= 60

The above table shows that the highest percentage of (46.7%) of the research sample falls within the category of the large role at a rate of role (43.8) degrees, followed by the category of the middle role by (43.3%) at a rate of role (312) degrees and that the lowest percentage was (10%) falls within the category of weak role at a rate of (17.6) degrees, it follows from this that less than half of the respondents describe their role in the use of farmers the correct methods to protect the rural environment from pollution with chemical pesticides in large and the reason for this may be attributed to the lack of Their information about these methods, the absence of guidance bulletins, the lack of training courses for them on this subject, and the

lack of treatment in the media, whether audio, print or visual.

**Third Objective: The role of the agricultural extension in the rural environment with chemical pesticides. The reasons lead farmers to pollute the rural environment with chemical pesticides**

The results of the research showed that the role of the agricultural extension ranged between (0 - 42) degrees at a rate of (25.6) degrees and the deviation of the standard J value (9.1) on the scale of the theoretical range (0 - 42) degrees and the number of items (21) paragraph has classified the respondents according to their role into (3) categories (weak - medium - large) as in Table 4

Table 4 Distribution of respondents according to their role in the causes that lead farmers to the rural environment with chemical pesticides.

Categories	Grade Categories	Number	%	Arithmetic mean for each category	Observations
Weak	0 – 13	7	11.7	8.1	Sd= 9.1
Medium	14 – 27	27	45	22.3	$\bar{x}$ = 25.6
big	28 – 42	26	43.3	33.6	N= 60

The above table shows that the highest percentage was (45) of the research sample

falls within the category of the middle role at a rate of (22.3) degrees, followed by the



category of the large role by (43.3%) at a rate of (33.6) degrees and that the lowest percentage was (11.7%) falls within the category of weak role at a rate of (8.1) degrees , it is concluded from this that less than half of the respondents describe their role in the reasons that lead farmers to pollute the rural environment with chemical pesticides The average tends to weak and may be attributed to weakness In their field follow-up of farmers and not going to the fields, especially during their agricultural pest control operations in their fields or orchards, as well as the weakness of extension education in this regard, especially in the field of how to dispose of control residues such as empty containers, hunting animals with pesticides and using them randomly, not benefiting from agricultural waste, lack of awareness, weak environmental control, and the spread of illiteracy among farmers.

### **Conclusions**

- 1- The general nature of the role of the agricultural extension in educating farmers about the legislation on the protection of the rural environment from pollution with chemical pesticides was average, and this reflects that the role of the agricultural extension in this area is not at the required level.
- 2- There is an urgent need to see more of this legislation to protect the rural environment from pollution.
- 3- The use of correct methods in protecting the environment and avoiding the causes that lead farmers to pollute it.

### **Recommendations:**

- 1-The researchers recommend that this study be adopted by the Ministry of Agriculture, Health and Environment.
- 2-Attention should be paid to the protection of the rural environment from chemical pesticide pollution by expanding the scope of training courses, extension seminars and printing relevant leaflets to

increase the knowledge of agricultural extension workers.

- 3-Conducting similar studies in other governorates where the dangers of chemical pesticides as pollutants of the rural environment and the role of the agricultural extension in reducing the dangers of this pollution are identified.

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## دور المرشد الزراعي في توعية الزراع بالتشريعات الخاصة بحماية البيئة من التلوث بالمبيدات الكيميائية

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### المستخلص

استهدف البحث تحديد دور المرشد الزراعي في توعية الزراع بالتشريعات الخاصة بحماية البيئة الريفية من التلوث بالمبيدات الكيميائية العاملين في دائرة الإرشاد والتدريب الزراعي وقسم الإرشاد الزراعي في مديرتي زراعة النجف الاشرف والقادسية، وتحديد دور المرشد الزراعي في محور استخدام الزراع الأساليب الصحيحة لحماية البيئة الريفية من التلوث بالمبيدات الكيميائية ومحور الأسباب التي تؤدي بالزراع إلى تلويث البيئة الريفية بالمبيدات الكيميائية ، ولتحقيق أهداف هذا البحث أعدت استبانة في ضوء مراجعة الأدبيات والتشريعات والقوانين والنشرات الإرشادية ذات العلاقة والمتكونة من (72) فقرة موزعة على (3) محاور هي، دور المرشد الزراعي في توعية الزراع بالتشريعات الخاصة بحماية البيئة الريفية من التلوث بالمبيدات الكيميائية ومحور دور المرشد الزراعي في استخدام الزراع الأساليب الصحيحة لحماية البيئة الريفية من التلوث بالمبيدات ومحور الأسباب التي تؤدي بالزراع إلى تلويث لبيئة الريفية بالمبيدات ، جمعت البيانات خلال شهري تموز و آب / 2022 بواسطة الاستبانة بطريقة المقابلة الشخصية من عينة عشوائية بسيطة بنسبة (100) بواقع (60) مرشدا زراعي ، وقد أظهرت نتائج البحث أن معدل دور المرشد الزراعي في توعية الزراع بالتشريعات الخاصة بحماية البيئة الريفية من التلوث بالمبيدات الكيميائية العاملين في دائرة الإرشاد والتدريب الزراعي وقسمي الإرشاد الزراعي في مديرتي زراعة النجف الاشرف والقادسية بلغ (58.9) درجة وان أعلى نسبة كانت (60%) وتقع ضمن فئة الدور الكبير ، كما أظهرت النتائج وجود دور كبير يميل إلى المتوسط في محور استخدام الزراع الأساليب الصحيحة لحماية البيئة الريفية من التلوث بالمبيدات الكيميائية بنسبة

(46.7%) ، وأظهرت النتائج وجود دور متوسط يميل إلى الضعيف في محور الأسباب التي تؤدي بالزراع إلى تلويث البيئة الريفية بالمبيدات الكيميائية بنسبة (45) ، يوصي الباحثون بتبني هذه الدراسة من قبل وزارتي الزراعة والصحة والبيئة ووجوب الاهتمام بموضوع حماية البيئة الريفية من التلوث بالمبيدات الكيميائية عن طريق توسيع نطاق الدورات التدريبية، الندوات الإرشادية وطبع النشرات الإرشادية المتعلقة بهذا الموضوع لزيادة وتعزيز أدور المرشدين الزراعيين في هذا المجال.

**الكلمات المفتاحية:** المرشد الزراعي ، توعية الزراع ، المبيدات الكيميائية