

The Role of Extension Communication in Enhancing Environmental Awareness among Farmers in Al-Dhuluya District \ Salah al-Din Governorate

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Abstract

The research aimed to identify the role of extension communication in enhancing environmental awareness among farmers in Al-Dhuluya District / Salah al-Din Governorate in general, and to determine the correlation between the role of extension communication in enhancing environmental awareness and some of the studied autonomous variables, namely: (age, educational level, years of work in agriculture, partaking in training courses, sources of information, attitude towards environmental awareness), the research included a sample of (30) respondents representing (12%) of the total community , a questionnaire was prepared to collect research data consisting of two parts, the first part includes measuring the independent variables, While the second part includes a test to measure the role of extension communication in enhancing environmental awareness, which includes 28 paragraphs distributed over two areas related to environmental awareness, the researcher verified (content validity and face validity), while reliability was found by a split-half reliability, whose value reached (0.832) and the validity of the measurement (0.912), The results revealed that the overall level of the role of extension communication in enhancing environmental awareness was moderately high, with 53.3% of respondents falling within the medium category, indicating the effectiveness of extension channels and the capacity of the rural community in Al-Dhuluya district to adopt environmental sustainability concepts. Statistically significant correlations were found at the 0.01 level with training courses, sources of information, and attitudes toward environmental

awareness, as well as at the 0.05 level with age, educational level, and farming experience, highlighting the combined influence of both communication-related and personal factors. These findings indicate that the effectiveness of extension communication largely depends on strengthening specialized training, diversifying information sources, and promoting positive attitudes among farmers, in addition to considering their personal characteristics such as age, educational level, and farming experience, due to their direct role in enhancing environmental awareness. Accordingly, the study recommends developing an integrated environmental extension strategy that emphasizes strengthening participation in high-quality training programs, diversifying extension information sources, adapting communication methods to farmers' characteristics, simplifying extension messages, and encouraging farmers' active participation and knowledge exchange to enhance environmental awareness and promote sustainable agricultural practices..

Keywords : Extension communication, environmental awareness, sustainable rural development.

Introduction

Over the past periods, the world has viewed a realisation that the change model followed is no lengthier sustainable, as the consumerist lifestyle has been associated with serious environmental catastrophes such as shrinking forest areas, water and air pollution, and increasing desertification,[26]. From this point of view, the field of agriculture in Iraq is one of the most important components of environmental preservation and its contribution to the Iraqi economy through what this vital sector provides of agricultural crops that enter as raw and intermediate materials in most other economic sectors, as well as its role in providing the necessary food products to meet the need for local demand for food, in addition to its effective contribution to GDP and economic growth in general,[1]. agriculture shows an necessary role in

levitation the living and social standard of the population, and constitutes a major source of national income and a field of work for the vast majority of the population of Arab republics [2]. And agriculture has become increasingly dependent on modern production techniques, but these innovations and techniques will not have an impact on improving the productive efficiency and performance level of farmers if they are not disseminated among them and taught how to apply them [16]. Maintainable development is the most important change in modern development thinking and the most important addition to the development literature in topical decades. Supportable development is located at the meeting point of the environment, economy and society, so governments must work to make the world population more aware

and interested in the environment and related issues, to possess the knowledge, skills, means, incentives and commitment to work as individuals or groups to find immediate solutions in the conservation and management of natural resources in the service of sustainable development, and sustainable development indicators contribute to assessing the progress of countries and institutions in achieving the welfare and progress of humanity [30]. To start agricultural development, it is necessary to carry out agricultural scientific research that generates scientific and applied results and recommendations and new agricultural techniques that are discovered and reached in agricultural research centres unless they reach farmers to be applied and benefit from them in improving agricultural production in quantity and quality and in the fastest time and the least effort and cost because agricultural development is not achieved unless there is a body or organisation that works to communicate these research, results, recommendations and agricultural techniques [23]. The agricultural environment is one of the most important components of the natural and social environment, as millions depend on it for their livelihoods, especially in rural communities. With

increasing environmental challenges such as desertification, land degradation, and water pollution, it has become necessary to raise environmental awareness among small-scale farmers. Here, the role of agricultural extension communication appears as an effective means of transferring environmental knowledge and information, and changing unsustainable behaviours [20], as communication science has become one of the sciences that play a major role in the lives of individuals, groups and countries, and communication has become a major and distinctive role in all social, cultural and educational fields in addition to economic and political [4], and communication is one of the areas of knowledge from which agricultural extension emerges and works through educational, research or applied, in addition to that communication is considered as a logic, medium and product of agricultural extension and agricultural extension is a communication process that aims to bring about desirable and specific changes in the behaviour of the guided audiences in order to improve their lives [20]. and extension communication is the process by which information, ideas and attitudes are shared to create a common understanding between individuals [27], [21].

In agriculture and rural development, communication plays a central role because farmers, extension workers, regularly to solve issues, as when extension communication is weak,

researchers and decision makers must exchange knowledge

technically sound recommendations do not reach farmers in time or are not

properly adopted [28] as environmental issues have become multidimensional, including economic, social and political dimensions, making it an urgent necessity and a national duty requiring all segments of society [25]. and environmental issues have received great attention not only in the magnitude of the issues that have affected the environment in recent decades, but have hindered the achievement of sustainable development goals and threatened human life on earth, which attracted the media and manifested in the emergence of environmental media, so that Where the media plays an important role in establishing environmental culture in society with great responsibility, environmental sense and a living human conscience to provide environmental benefit and society alike, by spreading environmental awareness in dealing with environmental issues and confirming the role of the media in directing public opinion towards the importance of the environment in a way that ensures its preservation[9] .as environmental awareness represents an important issue in our current world, which witnesses high rates of depletion of natural and industrial resources and requires more equitable ways of dealing with the environment, as the first stages of modifying this behaviour in dealing with the environment is raising awareness when publishing from[29] Salah al-Din Governorate is one of the important agricultural regions in Iraq. Al-Dhuluya district, in particular, is

environmental issues have become an important subject that the media put within their circle of interest [17] . Environmental sustainability has become a major concern due to the increasing pressure on natural resources and climate change [so the process of raising environmental awareness depends on several critical factors, including effective communication processes as an educational tool, , conscious consumption of information, and motivating, engaging and sharing the opinions of the target audience to promote environmental culture [18]

known for its diverse agricultural production, including both crop cultivation and livestock farming. With the growing importance of environmental issues and their impact on agriculture, it has become necessary to assess farmers' awareness of these issues. Accordingly, this study aims to identify the level of environmental awareness among farmers in Al-Dhuluya district and to evaluate the role of extension communication in enhancing this awareness. The research problem focuses on determining how effective extension communication is in improving farmers' environmental awareness. Therefore, the study seeks to answer the following question:

What is the role of extension communication in enhancing the environmental awareness of farmers in Al-Dhuluya district, Salah al-Din Governorate, Iraq?

Research Objectives:

1- To identify the role of extension communication in enhancing environmental awareness among farmers in Al-Dhuluya district / Salah Al-Din governorate.

2- Determine the correlation between the role of extension communication in

Operational Definitions:

1- Role: It is the practice of planned awareness and training activities carried out by extension workers, which aim to bring about desirable behavioural changes.

2- Extension Communication: It is the dynamic process through which environmental ideas and innovations are transferred from their sources (research centres) to farmers through communication channels.

3- Enhancing: It is the process that aims to create a positive momentum or a

enhancing environmental awareness and the following independent variables (age, educational level, years of work in agriculture, participation in training courses, access to information sources, and attitude towards environmental awareness).

quantitative and qualitative increase in the level of a particular variable.

4- Environmental Awareness: It means the cognitive and emotional outcome of the farmer towards the protection of natural resources.

5- Farmers: They are the individuals who make agriculture their primary occupation in the study area, who are responsible for making the production decision, and represent the unit of response on which the impact of the extension communication message is measured.

Materials and Methods

Research methodology

In conducting the research, the researcher used the descriptive method to achieve the research objectives and reach the results, and the descriptive method is defined as: - a method of

describing the subject to be studied through a correct scientific methodology and depicting the results obtained on expressive numerical forms that can be interpreted [3]

Research Area

Al-Dhuluya District (southeast of Salah al-Din) is a strategic agricultural research area, characterised by the fertility of its soil and its location on the Tigris River, which makes it an ideal

environment for the production of cereal crops (wheat) and seed multiplication, in addition to the cultivation of palm trees and orchards, which contributes to food security and

applied research to increase agricultural

production

in

Iraq.

Research population and sample

The research population included all farmers belonging to the agricultural division in Al-Dhuluya district, namely Al-Dhuluya Agricultural Division and Al-Hardaniya Agricultural Division, which consists of (250) farmers, according to the statistics of the above-mentioned agricultural divisions. A

Preparation of the questionnaire

The questionnaire was prepared in its initial form in line with the research objectives after the researcher's review of sources, literature and scientific studies and taking the advice of experts in the field and the questionnaire consisted of two parts: The first part: The first part includes data related to the personal characteristics of farmers,

random sample of (12%) was randomly selected, bringing the number of respondents who underwent the research procedures to (30) respondents, after excluding the initial test sample of (20) respondents from the research population.

namely: (age, educational level, years of work in agriculture, participation in training courses, sources of information, attitude towards environmental awareness) The second part: The questionnaire consisted of (28) standard paragraphs to measure the role of extension communication in enhancing environmental awareness as well as determining their level of environmental awareness.

Validity

It means the clarity of the questionnaire, its vocabulary, the questionnaire paragraphs and its concept to the members of the study sample who will be included in the questionnaire and there are other definitions of validity, which is that the questionnaire reflects the intended content (measurement) according to the

relative weight [15] the observations and opinions of validity experts were taken into account with regard to the extent of the survival of the fields and paragraphs, whether by deleting, adding or modifying some of them through a triple scale (agree, neutral, disagree) were given the numbers (3,2,1) respectively.

Measuring Reliability

Reliability is defined as the ability of an instrument to give approximately the same results if it is reapplied to the same group under the same conditions [5]. The reliability coefficient was measured from through the use of the split-half method (odd and even) and

finding the correlation according to the Pearson equation and its value reached (0.712) which is considered the reliability of half of the scale and for the purpose of correcting it for the entire scale, the correction equation (Spearman - Brown) was used and its

value reached (0.832) To obtain the validity coefficient of the test, the reliability coefficient was rooted with a value of (0.912), as the reliability coefficient is acceptable if its value reaches (0.70) and more whenever it approaches the right one, and after the

Measuring the independent variables

1-Age: It was measured by the number of years of the respondent's life until the moment of data collection.

2-Educational level: It was measured through eight educational levels (illiterate, reading and writing, elementary, middle school, institute, bachelor's degree, postgraduate degree), given numerical values (8,1,2,3,4,5,6,7), respectively (1,2,3,4,5,6,7).

3-Years working in agriculture: Measured by the number of years the respondent spent in agriculture.

4-Participation in training courses: Measured by alternatives (yes, no) and given numerical values (1,2) respectively.

5-Sources of information: This variable was measured through (five) sources from which the respondent can obtain information, and the following alternatives (often, sometimes, rarely, rarely, never) were placed in front of it and given the following numerical values in order (1,2,3,4), thus reaching

scientific conditions of the questionnaire have been fulfilled, which are the tests (reliability and validity) on the paragraphs of the scale, the form is ready to collect data from the respondents

the theoretical range of contact with information sources (5 - 20)

6-Attitude towards environmental awareness: This variable was measured through ten items using a three-level Likert scale (Agree, Neutral, Disagree) and was given numerical values (3,2,1) consecutively for positive items and (1,2,3) for negative items. Thus, the theoretical range of the attitude scale was (10 - 30), knowing that the reliability of the attitude statements was extracted and amounted to (0.84).

Measuring the dependent variable: The role of counselling communication in enhancing environmental awareness was measured through a scale that included 28 standard paragraphs divided into two areas, each of which was placed in front of a five-level scale (strongly agree, agree, neutral, disagree, strongly disagree) and given numerical values (1,2,3,4,5) respectively and the value of the theoretical range of the scale as a whole (28 - 140) The data collection process took place during the period of time (from 06/09/2025 to 16/12/2025)

Results and discussion

First objective: To identify the role of extension communication in enhancing

environmental awareness among farmers in Dhuluya district / Salah al-Din governorate in general.

The results, as shown in Table (1), showed that the highest percentage of respondents fell in the medium category by 53.3%, followed by the high category by 40% and the lowest percentage of respondents in the low category by 6.7%. The result shows that the role of agricultural extension communication in enhancing environmental awareness is moderate and tends to increase in general, and this indicates the success of extension

communication in the region in delivering basic environmental messages to farmers, and may also reflect the accumulation of experiences among farmers as a result of the climatic and environmental changes they faced in the field. We also note that the standard deviation value reached 11.95, which indicates that there is relative homogeneity in the level of farmers' awareness, which facilitates the process of planning successful group extension programmes, and this agrees with the study of [21]

Table 1: Distribution of respondents according to the categories of the extension communication role in enhancing environmental awareness.

No.	Categories	Repetition	%	Average
1	Low (85-68)	2	6.7	75.00
2	Medium (86 - 103)	16	53.3	95.38
3	High (104 - 121)	12	40.0	112.25
The Total		30	100	Mean=100.77 Sd=11.95

Second Objective: To determine the correlation between the role of counselling communication in enhancing environmental awareness and each of the following variables.

1- Age: As shown in Table (2), there is a convergence in the relative personal characteristics of counsellors increases the efficiency of group counselling methods and reduces communication barriers. The statistical

distribution of the age groups of the study sample, which reflects the state of homogeneity that contributes to enhancing social interaction, as the percentage of the medium category reached 36.7%, the high 33.3% and the low 30.0%, which is consistent with what [11]. Homogeneity in the treatment also revealed that there is a moderate direct correlation between the age of the respondents and the role of counselling communication in

enhancing environmental awareness, with a Pearson correlation coefficient value of 0.422 and statistical significance of 0.020, which is significant at (0.05) level. This result is consistent with the study [13], which emphasised that age gives the farmer a greater ability to monitor environmental issues as a result of practice.

2-Education level: As shown in Table 2, the group with limited education (illiterate 10%, reading and writing 20% represents about 16.7%, which means that relying on written leaflets alone in enhancing environmental awareness will not be effective with almost a third of the sample, and here significant at (0.05), which means that there is a clear relationship between increasing educational level and increasing or decreasing environmental awareness, but it is not a very strong relationship (which is usually above 0.7). The results of the current study are consistent with the findings of Al-Samadni, and Al-Tanoubi, [10] [12]

3-Years of working in agriculture: As shown in Table (2), the results revealed that the medium category is the largest with 43.3% followed by the high category with 30.0%. The high level of experience in the study sample is a positive indicator of the reliability of agricultural activity, but it poses a challenge to "extension communication"; long experience sometimes leads to "resistance to change". Therefore, extension should focus on highlighting the economic return of environmental awareness

the importance of personal communication and visual mass communication emerges. The group with intermediate education (primary, intermediate, preparatory) represents the largest percentage by 46.7% and the group with higher education (diploma, bachelor's degree, higher degree) by 36.7%, the high level of education is positively related to the ability to understand complex environmental techniques and risk adopting them, these individuals are the bridge through which environmental awareness will cross to the rest of the farmers. The results also revealed a Rho Spearman's value of 0.453 and a statistical significance of 0.012 (such as reducing the costs of chemical fertilisers) to ensure the response of these expert groups. The Pearson value of 0.363 and statistical significance of 0.049, is significant at 0.05, which means that there is a moderate direct relationship (i.e. the more "years of experience in agriculture", the more environmental awareness) This is consistent with [6].

4-Participation in training courses: As shown in table (2), the result showed that the vast majority of the respondents (80%) were actively involved in the training courses and only 20% did not. This percentage reflects the success of the extension communication means in reaching the target audience and convincing them of the importance of training and this provides a fertile ground for spreading environmental awareness, as it was found that the Spearman's Rho value reached 0.659

and statistical significance (0.000), which confirms the existence of a strong correlation at 0.01, and this confirms that the results are not due to chance but due to the training courses in accordance with [24] .

5-Sources of Information: As shown in table (2), the medium category is the largest with 53.3%, which means that agricultural extension exists as a platform for environmental information, but it does not reach the majority of the target group, followed by the low category with 30.0%, this indicator needs to be identified as they lack sufficient access to information, then came the high category with 16.7%, which reflects a gap in access to information. This reflects a gap in the arrival of specialised and deep guidance messages that raise environmental awareness to advanced levels. Pearson's value was 0.737 and statistical significance (0.000) (significant at 0.01), The results indicate a positive and strong correlation, meaning that the greater the farmer's reliance on extension information sources, the

higher their level of environmental awareness. This finding is consistent with the results of Al-Riyami & Busaidi and Liu [8], [19]. The strength of this relationship reflects the pivotal role of extension communication in influencing and shaping farmers' environmental beliefs.

6- Attitude toward environmental awareness: Table (2) shows that the majority of respondents fall within the positive attitude category (63.3%), followed by the neutral category (20.0%), and the negative category (16.7%). This distribution confirms that extension communication is not limited to the transfer of information, but also serves as an effective tool in influencing and improving farmers' attitudes.

The Spearman's rho correlation coefficient reached (0.480) with a statistical significance level of (0.007) , which is significant at the (0.01) level. This indicates a moderate positive relationship between farmers' attitudes toward environmental awareness and the role of extension communication.

Table 2: Correlation between the role of extension communication and some independent variables.

Categories	Repetition	%	P value	Pearson	Spearman's rho
Age:					
(36-24) years	9	30.0	0.020	0.422*	
(37-49) years	11	36.7			
(50 -and more) years	10	33.3			

The Total	30	100			
Educational level:					
Illiterate	3	10.0	0.012		0.453*
Literate	2	6.7			
Elementary School	6	20.0			
Middle School	5	16.7			
High School	3	10.0			
Diploma	6	20.0			
Bachelor's	3	10.0			
Postgraduate	2	6.7			
Years of farming experience:					
(18 - 5) years	8	26.7	0.049	0.363*	
(32-19) years	13	43.3			
(33- And more) years	9	30.0			
Participants in training courses:					
Participants	24	80.0	0.000		0.659**
Non- Participants	6	20.0			
Sources of Information:					
Low (5-10)	9	30.0	0.000	0.737**	
Medium (11-15)	16	53.3			
High (16- And more)	5	16.7			
Attitude Towards Environmental Awareness:					
Negative (10-16)	5	16.7	0.007		0.480**
Neutral(17-23)	6	20.0			
Positive (24-30)	19	63.3			

Significant at p0.05*

Significant at p0.01**

Conclusions and Recommendations:

1- The results indicated that the overall level of the role of extension communication in enhancing environmental awareness was moderate to high, reflecting the effectiveness of the extension channels used and the readiness of the rural community to adopt environmental sustainability concepts.

2- The results revealed a statistically significant correlation at the 0.01 level between the role of extension communication in enhancing environmental awareness and each of the following variables: (Training courses , Sources of information , Attitude toward environmental awareness)

This indicates that:

Specialized training is the most influential factor in the extension communication system. Reliance on reliable and diverse information sources

Recommendations:

1- It is recommended to intensify participatory extension programmes and employ modern communication methods to enhance the role of environmental agricultural extension, with the aim of transforming the (moderate–high) level of awareness into sustainable and tangible behavioural practices on the ground. (Responsible entities: Ministry of Agriculture, Salah

improves the effectiveness of extension messages. Farmers' psychological readiness and personal convictions represent a key foundation for environmental sustainability.

3- The results also showed a statistically significant correlation at the 0.05 level between the role of extension communication and: (Age , Educational level , Years of experience in agriculture)

This indicates that:

Older farmers are more responsive to extension messages.

Higher education leads to higher environmental awareness.

Practical experience enhances farmers' ability to benefit from extension communication.

al-Din Agriculture Directorate, and Agricultural Extension Centers).

2- It is recommended to diversify and adapt extension communication channels to suit the age characteristics of farmers, with a focus on designing environmental extension programmes targeting youth using digital communication technologies, while utilizing older farmers as local opinion

leaders to enhance collective environmental awareness in the rural community. (Responsible entities: Ministry of Agriculture, Salah al-Din Agriculture Directorate, Agricultural Extension Centers, and Colleges of Agriculture).

3- It is recommended to simplify and refine environmental extension messages directed at farmers with low educational levels, relying on visual and field-based methods (such as field schools) to reduce the knowledge gap, while engaging more educated farmers as lead models in adopting environmentally friendly agricultural

practices. (Responsible entities: Agricultural Extension Centers, Salah al-Din Agriculture Directorate, Ministry of Agriculture, and Colleges of Agriculture).

4- It is recommended to encourage farmers to actively participate in extension activities and exchange experiences among themselves, in order to enhance practical learning and increase the adoption of environmentally sustainable agricultural practices within the rural community. (Responsible entities: farmers, extension agents, and Agricultural Extension Centers)

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