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Evaluating the efficiency of the agricultural extension system in Iraq from the farmers' perspective

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Abstract

This study aims to evaluate the efficiency of the agricultural extension system in Iraq from the farmers' perspective, given its pivotal role in transferring knowledge and modern technologies and achieving rural development. The study relied on a questionnaire that included (384) farmers distributed across three geographical regions (the central region, the southern region, and the northern region). The study addressed six main themes, including extension visits, program content, extension worker competence, and the impact of services on production and income. The results revealed significant differences between regions in some themes, such as extension visits favoring the southern region, program content favoring the central region, and training favoring the southern region. However, no differences were found in the competence of extension workers and communication methods. The results indicated that agricultural extension enjoys the confidence of farmers, but requires improvements in the regularity of visits and the development of program content. The study recommends increasing farmer participation in program design, appointing qualified extension workers, and strengthening institutional coordination to improve the efficiency of the extension system.

Keywords: Farmers, evaluation, agricultural extension efficiency

Introduction

The agricultural sector is one of the most vital sectors with a direct impact on the agricultural economy in most countries of the world, especially developing countries, including Arab countries. In recent decades, agriculture has become increasingly dependent on modern production techniques and methods ^[1]. However, these new technologies will not achieve a tangible impact in improving production efficiency and farmers' performance levels unless they are widely distributed among them. ^[2] Agricultural rural development is a fundamental pillar for achieving food security and social stability in Iraq. It contributes to improving infrastructure, providing basic services, and enhancing farmers' production capacities ^[3], which raises the standard of living in rural areas and reduces the gap between urban and rural areas. In this context, agricultural extension plays a pivotal role as a systematic educational process aimed at transferring modern knowledge and techniques to farmers ^[4], enabling them to improve their agricultural practices and increase their productivity levels. Agricultural extension services are an essential means of preserving natural resources and ensuring their sustainability by raising farmers' awareness of the importance of rational and responsible use of these resources, including water, soil, forests, pastures, and others ^[5]. Therefore, agricultural extension is experiencing great and continuous pressure in the field of improving management and raising the effectiveness of Responding to the needs of farmers and their contemporary challenges in a way that ensures the fulfillment of the requirements of all

rural groups of men, women, and youth working in agricultural activity ^[6]. The agricultural extension service in Iraq is considered one of the basic factors that contribute to improving agricultural production and developing the agricultural sector in general ^[7]. Iraq has fertile lands and flowing rivers, which makes it one of the countries with great agricultural potential, as most of the agricultural crops that meet the needs of the local market are grown and sometimes exported abroad. In addition, Iraq has human resources capable of contributing significantly to improving agricultural performance, but these resources need continuous training and development. Hence, the importance of the agricultural extension service in providing information and modern technologies that enable farmers to increase their production and improve the quality of their crops ^[8]. Despite the importance of agricultural extension in supporting agricultural development and enhancing the efficiency of farmers, the provision of its services in Iraq faces many obstacles that vary in severity and impact, and can be classified into five main areas that represent vital dimensions in understanding the roots of the problem. At the administrative and organizational level ^[9], weak institutional coordination and the absence of planning emerge as factors that reduce the effectiveness of extension programs. In the human field, the lack of qualified personnel and weak training programs affect Negatively affecting the efficiency of extension performance, the challenge deepens in the financial field due to the lack of funding and the weak allocation of resources necessary to implement extension activities ^[10]. The technical and technological field also

faces difficulties related to the weak use of modern technology in transferring knowledge to farmers, and finally the social and cultural aspect represents an additional obstacle represented by resistance to change and the weak awareness of farmers of the culture of agricultural extension [11].

Research Objectives

The study aims to identify statistical differences in farmers' assessment of the efficiency of the agricultural extension system in Iraq from their perspective.

Research Hypotheses

Null Hypothesis: The agricultural extension system in Iraq is not operating efficiently.

Alternate Hypothesis: The agricultural extension system in Iraq is operating efficiently.

Study Area

The Republic of Iraq is located in southwest Asia and is bordered to the north by Turkey, to the east by Iran, to the west by Syria and Jordan, and to the south by Saudi Arabia and Kuwait. Iraq is considered a country with significant

agricultural potential, with an estimated arable area of approximately 9.5 million hectares. However, the actual cultivated area amounts to only about 5 million hectares, equivalent to 22% of the country's total area. Iraq consists of three main geographical regions: the northern region (including governorates such as Nineveh, Dohuk, Erbil, Sulaymaniyah, and Kirkuk), the central region (Baghdad, Diyala, Anbar, Salah al-Din, Wasit, Karbala, and Babil), and the southern region (including Basra, Najaf, Dhi Qar, Muthanna, Qadisiyah, and Maysan). Each region is characterized by climatic and agricultural diversity, which influences the type of crops grown and production patterns.

Research Population and Sample

According to the sample size determination table of Krejcie & Morgan (1970), populations with a size exceeding 100,000 are eligible for a sample size of 384. After determining the total sample size, the sample size was calculated for each governorate according to the proportional stratified sampling law, based on the distribution of population size in each governorate, as shown in Table 1:

Table 1: Study population and sample of farmers

No.	Governorate	Number of Farmers	Percentage	Sample Size (Sampling)
1	Nineveh	24,222	7.6%	29
2	Kirkuk	18,748	5.9%	23
3	Salah al-Din	57,067	18%	69
4	Diyala	21,294	6.7%	26
5	Anbar	26,417	8.3%	32
6	Baghdad / Karkh	2,478	0.8%	3
7	Baghdad / Rusafa	19,932	6.3%	24
8	Babil	33,398	10.5%	40
9	Wasit	26,002	8.2%	31
10	Karbala	6,289	2%	8
11	Al-Qadisiyyah	17,034	5.4%	21
12	Najaf	23,899	7.5%	29
13	Maysan	10,272	3.2%	12
14	Dhi Qar	17,911	5.6%	22
15	Al-Muthanna	5,527	1.7%	7
16	Basra	6,850	2.2%	8
	Total	317,340	100%	384

Data Collection Tool:

A questionnaire was used to collect data and information for this study. A questionnaire was designed for farmers. This questionnaire included (32) questions distributed across six main axes: (Types of visits, content of the extension program, the competence of agricultural extension workers from the farmers' perspective, the impact of extension services provided on increasing production and improving income, extension communication methods and aids used, and farmer training).

Results and Discussion

Statistical Significance Test (One-Way Analysis of Variance Test)

The research community consists of three main geographical regions: the northern region (including the

governorates of Nineveh and Kirkuk), the central region (including the governorates of Baghdad, Diyala, Anbar, Salah al-Din, Wasit, Karbala, and Babil), and the southern region (including Basra, Najaf, Dhi Qar, Muthanna, Qadisiyah, and Maysan). The one-way analysis of variance (ANOVA) test will be used to identify statistical differences between these regions in farmers' assessment of the efficiency of the agricultural extension system in Iraq, based on the various axes included in the questionnaire.

1- Types of visits to reach farmers

Table (2) shows the results of the one-way analysis of variance (ANOVA) to test the differences between the three agricultural regions in farmers' assessment of the efficiency of various types of extension visits within the agricultural extension system in Iraq:

Table 2: One-Way Analysis of Variance (ANOVA) test to identify differences between the study regions

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	52	13.5%	13.2	0.019	Significant differences in favor of the Southern Region
Central Region	233	60.7%	15.8		
Southern Region	99	25.8%	17.3		
Total	384	100%	—		

The results of the one-way analysis of variance indicate significant differences at a significance level of 0.05 or less ($p = 0.019$) between the three geographical regions in farmers' evaluation of the visit axis, with the southern region recording the highest average (17.3) compared to the central region (15.8) and the northern region (13.2). This disparity reflects farmers' greater satisfaction with agricultural extension visits in the southern region. This is likely due to better organization of visits in these regions or relative stability in extension services compared to other regions,

particularly the northern region, which may suffer from weak field coverage or limited human resources.

2- The content of extension programs and their relevance to farmers' problems

Table (3) shows the results of the one-way analysis of variance, testing the differences between the three agricultural regions in farmers' evaluation of the efficiency of extension program content and its relevance to farmers' problems within the agricultural extension system in Iraq:

Table 3: One-way analysis of variance test for the content of extension programs and their relevance to farmers' problems

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	134	34.9%	16.28	0.031	Significant difference in favor of the Central Region
Central Region	148	38.5%	18.40		
Southern Region	102	26.6%	15.93		
Total	384	100%	—		

The results of the one-way analysis of variance indicate significant differences at a significance level of 0.05 or less ($p = 0.031$) between the three geographical regions in farmers' assessment of the content of extension programs and their relevance to their problems. The central region recorded the highest mean (18.40) compared to the northern region (16.28) and the southern region (15.93). This disparity reflects farmers in the central region's perception of the greater relevance of the extension programs offered to their agricultural problems. This is likely due to better coordination between extension and research institutions or

the intensity of interactive extension activities in these regions, given their proximity to the capital compared to other regions.

3- The Competence of Agricultural Extension Workers from the Farmers' Perspective

Table (4) shows the results of the one-way analysis of variance, testing the differences between the three agricultural regions in farmers' assessment of the competence of agricultural extension workers within the agricultural extension system in Iraq:

Table 4: One-way analysis of variance test, testing the differences between the study regions

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	52	13.5%	20.4	0.217	No significant differences
Central Region	233	60.7%	20.8		
Southern Region	99	25.8%	20.6		
Total	384	100%	—		

The results of the one-way analysis of variance indicate no significant differences at a significance level of 0.05 or less ($p = 0.217$) between the three geographical regions in farmers' assessment of the axis of agricultural extension workers' competence. The averages were very close and relatively high (20.8 for the central region, 20.6 for the southern region, and 20.4 for the northern region). This convergence reflects a high and consistent level of satisfaction among farmers across the various regions with the performance of extension workers. This is likely due to a relative improvement in extension workers' skills or the

similarity of the methods used in agricultural extension across all Iraqi governorates.

4- The axis of the impact of extension services provided on increasing production and improving income

Table (5) shows the results of the one-way analysis of variance, testing the differences between the three agricultural regions in farmers' assessment of the impact of extension services provided on increasing production and improving income within the agricultural extension system in Iraq:

Table 5: One-way analysis of variance test, to determine the differences between the study regions

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	52	13.5%	21.1	0.027	Significant differences in favor of the Northern Region
Central Region	233	60.7%	16.8		
Southern Region	99	25.8%	19.2		
Total	384	100%	—		

The results of the one-way analysis of variance indicate significant differences at a significance level of 0.05 or less ($p = 0.027$) between the three geographical regions in farmers' assessment of the impact of extension services provided on increasing production and improving income. The northern region recorded the highest average assessment (21.1) compared to the central region (16.8) and the southern region (19.2). This disparity reflects the greater positive impact of extension services in the northern region. This is attributed to the fertility of its soil, its high suitability

for agriculture, and the few agricultural problems it faces compared to other regions, facilitating tangible increases in production and improved agricultural income.

5- Extension Communication Methods and Aids Used

Table (6) shows the results of the one-way analysis of variance, testing the differences between the three agricultural regions in farmers' assessment of the extension communication methods and aids used within the agricultural extension system in Iraq:

Table 6: One-way analysis of variance test to determine differences in farmers' assessment of extension communication methods and aids

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	52	13.5%	21.7	0.389	No significant differences
Central Region	233	60.7%	21.5		
Southern Region	99	25.8%	21.6		
Total	384	100%	—		

The results of the one-way analysis of variance indicate no significant differences at a significance level of 0.05 or less ($p = 0.389$) between the three geographical regions in farmers' assessment of the extension communication methods and aids used. The averages were close (21.7 for the northern region, 21.5 for the central region, and 21.6 for the southern region). This closeness reflects the similarity in the extension devices and tools used. This is attributed to the fact that the agricultural extension system in Iraq is characterized by a central administrative system, where

directives and instructions are issued uniformly to all agricultural extension centers in the governorates, making the aids almost identical across the different regions.

6- Farmer Training Axis

Table (7) shows the results of the one-way analysis of variance to test the differences between the three agricultural regions in farmers' assessment of the efficiency of farmer training within the agricultural extension system in Iraq:

Table 7: Identifying the differences between the study regions in farmers' assessment of the efficiency of farmer training

Geographic Region	Sample Size	Percentage (%)	Mean Score	Significance Value	Remark
Northern Region	52	13.5%	16.2	0.042	Significant differences in favor of the Southern Region
Central Region	233	60.7%	14.6		
Southern Region	99	25.8%	18.4		
Total	384	100%	—		

The results of a one-way analysis of variance indicate significant differences at a significance level of 0.05 or less ($p = 0.042$) between the three geographic regions in farmers' evaluation of the farmer training component. The southern region recorded the highest average evaluation (18.4) compared to the central region (14.6) and the northern region (16.2). This difference in the southern region is attributed to the large number of training centers and farmers' interaction with them. Furthermore, the central and northern governorates are characterized by larger geographical areas, which limits the possibility of comprehensive training coverage, thus affecting the overall assessment of training efficiency.

Conclusion

1. Agricultural extension in Iraq enjoys the confidence of farmers, particularly in the ability of extension workers to explain and interact directly with them.
2. From the farmers' perspective, extension workers' visits to farmers are irregular and require improvements in planning mechanisms and geographical distribution.
3. The content of extension programs does not cover all farmers' needs and requires greater farmer involvement in their design.
4. There are statistically significant differences between

Iraqi regions in the effectiveness of some extension services from the farmers' perspective, indicating disparities in field performance between regions and requiring balancing and concerted efforts.

Recommendations

Based on the results of this study and to improve the efficiency of the agricultural extension system in Iraq, the researcher recommends the following:

1. The need to involve farmers in designing and updating extension programs to ensure they align with their actual needs and achieve greater implementation effectiveness.
2. The central government should open the door to appointments for qualified agricultural extension workers according to fair professional standards, taking into account specialization and geographical distribution to compensate for the severe shortage of personnel.
3. The study recommends increased coordination between the General Authority for Extension and various supporting agencies, whether governmental or civil society organizations, to activate the role of extension in developing the agricultural sector and improving the marketing of agricultural produce.

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