

The role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate

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Abstract

The research aimed to identify the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate, as well as related areas such as (digital extension marketing platforms, the role of platforms in supporting agricultural production, developing digital extension mechanisms and enhancing their role in improving the quality of agricultural production, obstacles facing employees in using digital platforms, and the correlation between the dependent variable with role of (age, years of service, and educational qualification). The descriptive analytical method and quantitative approach were used in this research. The community consisted of agricultural employees in Baghdad Governorate, as well as the Department of Agricultural Extension and Training, totaling 418 and 342 employees, respectively. The research included (760) employees, and a random sample of (25%) was drawn from the total number of employees, resulting in a sample size of (190) respondents. A questionnaire was used as the data collection tool for the respondents. The item was distributed across four domains and measured using a five-point scale constructed according to the Likert scale. Weights of 1, 2, 3, 4, and 5 were assigned to the respondents' responses (strongly agree, agree, neutral, disagree, and strongly disagree), respectively. Thus, the scale values ranged from 1.0 to 5.0, with a hypothetical mean of 3.0. To verify the reliability of the scales, Cronbach's alpha was used, and the overall reliability coefficient for the scale domains was found to be 0.90. Data were collected in December 2025. The results showed that employees' knowledge of digital platforms was moderate to high, and the role of these platforms in supporting production was strong and effective. The most prominent recommendation was for the Ministry of Agriculture, specifically the Baghdad Governorate Agriculture Directorate and the Department of Agricultural Extension and Training, to enhance ongoing training programs for employees on the use of digital platforms and to develop the internet infrastructure within agricultural departments.

Keywords: Marketing platforms, agricultural extension, crop production, Baghdad Governorate.

Introduction

Agriculture is considered one of the main pillars of Iraq's national economy, providing food, contributing to income improvement, and creating wide employment opportunities. With modern technological developments, there has been an urgent need to rely on digital tools to enhance agricultural productivity and

improve the quality of extension services provided to farmers [7].

Agricultural extension marketing platforms are among the most important of these tools, as they help agricultural employees provide accurate information on farming practices, planting and harvesting schedules, crop

marketing, and methods to improve production [3]. Studies also indicate that adopting digital platforms in agricultural extension enhances employees' job performance and increases the effectiveness of information transfer to farmers [5].

In the Iraqi context, traditional agricultural extension faces several challenges, such as weak infrastructure, limited resources, insufficient training, and difficulty accessing up-to-date information [1]. Therefore, digital platforms are crucial for improving extension work efficiency and facilitating faster and more accurate access to information for farmers.

Recent studies show that continuous training on using digital platforms increases employees' knowledge and enables them to provide precise guidance to farmers, positively impacting agricultural productivity [9]. These platforms also help predict agricultural risks, such as climate changes and crop diseases, and provide timely recommendations.

Over the past decades, agricultural extension services have become a fundamental pillar supporting sustainable agricultural development, especially in developing countries that face challenges such as low productivity and weak marketing efficiency. The concept of agricultural extension has evolved from a technical activity focused solely on transferring production recommendations to an integrated system encompassing technical, marketing, and organizational aspects, contributing to better farmers' decisions, enhanced resource use efficiency, and increased crop production [4].

In this context, agricultural extension marketing platforms have emerged as modern tools aimed at linking the production process with markets by providing farmers and producers with information on prices, market requirements, optimal marketing timings, and post-harvest handling. Recent literature

indicates that integrating extension with marketing helps reduce the gap between production and demand and enhances the competitiveness of agricultural products, positively affecting the quantity and quality of production [6].

Global studies confirm that agricultural extension services, when including an effective marketing component, directly impact crop productivity by guiding farmers toward selecting high-demand crops and adopting production practices aligned with market quality and specifications. These studies also highlight that agricultural employees are the key link in ensuring the success of this role due to their technical expertise and ability to translate marketing information into actionable field recommendations [10].

In the Arab context, recent studies have shown that agricultural marketing extension still suffers from weak implementation compared to production-oriented extension, despite the awareness of agricultural employees regarding its importance for supporting production and improving farmers' income. A study conducted in Egypt revealed that activating the marketing role of agricultural extension contributed to improving the marketing of some horticultural crops, reducing losses, increasing marketable quantities, and enhancing farmers' economic returns. These results underscore the importance of adopting integrated extension policies focusing on both production and marketing aspects [11].

In Iraq, field studies indicate that the use of information technology in agricultural extension, particularly in marketing, enhances the efficiency and effectiveness of extension services. A study in Wasit Governorate showed that agricultural employees' reliance on IT tools in marketing extension improved the quality of information provided to farmers and helped them make production decisions aligned with market requirements, positively

reflecting on crop production. This trend is particularly important for Baghdad Governorate due to its proximity to central markets and diversity of agricultural activities [7].

Literature also points out that the perspective of agricultural employees represents a crucial indicator for evaluating the effectiveness of agricultural extension marketing platforms, as they are best positioned to identify practical challenges such as weak digital infrastructure, limited training, or lack of coordination between extension and marketing entities. A study conducted in Nineveh Governorate revealed that the level of satisfaction of extension employees with the services provided is closely linked to the adoption of extension recommendations by farmers, ultimately affecting agricultural production levels [12].

At the international level, recent studies have confirmed that the shift toward digital platforms in agricultural extension is a promising approach for supporting both production and marketing. These platforms allow rapid access to information, customization according to producers' needs, and enhanced communication between farmers, extension agents, and markets. Investment in developing these platforms and training agricultural employees in their use can significantly contribute to crop production and food security [14].

In conclusion, agricultural extension marketing platforms represent a strategic tool for supporting crop production, especially when evaluated from the perspective of agricultural employees, who are central to implementing extension programs. This topic is particularly relevant in Baghdad Governorate due to its production and marketing potential, necessitating in-depth field studies to assess the status of these platforms and determine ways to develop them to support agricultural production.

Accordingly, the research question focuses on understanding the role of digital platforms from the perspective of agricultural employees to evaluate their effectiveness, identify strengths and weaknesses, and formulate policies to improve digital agricultural extension, as employees serve as the primary link between platforms and farmers.

Research Objectives

First: To identify the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate.

Second: Sub-objectives according to research areas:

- 1- To determine the level of agricultural employees' knowledge of digital extension marketing platforms.
- 2- To determine the extent of the platforms' role in supporting agricultural production.
- 3- To determine the level of development of digital extension mechanisms and enhance their role in improving the quality of agricultural production.
- 4- To identify the obstacles that employees face in using digital platforms.

Third: To determine the correlation between the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate and the independent factors (age, years of service, and educational qualification).

Research Hypotheses

1. There is a statistically significant relationship between age and the role of platforms in supporting production.

2. There is a statistically significant relationship between years of experience and the role of platforms.
3. There is a statistically significant relationship between educational qualification and the role of platforms.
4. There is a positive relationship between employee knowledge of digital platforms and their role in supporting production.
5. Obstacles negatively affect the effectiveness of platform use.
6. Developing digital extension mechanisms increases the effectiveness of extension work and agricultural production.

Research Methodology

This research employs a descriptive-analytical approach and quantitative methods to investigate the impact of the independent variable on the dependent variable in field research. The aim is to provide a detailed and comprehensive description and interpretation of the phenomena or topics under study [17] [18].

-Research Sample

The number of agricultural workers in the governorates covered by the research is (760) employees. A random sample of (25%). The sample was taken from the total number of employees working in Baghdad Governorate and the Department of Agricultural Extension and Training, which numbered 418 and 342 employees, respectively. The sample size was 190 respondents, out of a total of 760 employees.

-Data collection tool

The questionnaire form was used as a tool to collect data from respondents in the relevant departments because it is one of the most commonly used methods in the data collection process [19] [20]. A preliminary questionnaire was developed after reviewing scientific sources, previous studies, and research related

to digital marketing platforms in agricultural extension, and consulting with university professors and specialists in computer science, software, and agricultural extension. Based on this, the questionnaire was designed to assess the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate. Thirty-four (34) items were identified, distributed across four domains. The first domain covered platform knowledge (8 items), the second addressed the role of platforms in supporting production (10 items), the third focused on developing mechanisms for digital expansion (9 items), and the fourth addressed obstacles to using platforms (7 items). Responses were measured using a five-point scale designed according to the Likert scale. Weights of 1, 2, 3, 4, and 5 were assigned to the respondents' responses (strongly agree, agree, neutral, disagree, and strongly disagree), respectively. Thus, the scale values ranged from 1.0 to 5.0, with a mean of Hypothesis 3.0

- Validity and Reliability Procedures

Reliability refers to the degree of validity of an item and its persistence in the questionnaire, ensuring that scores accurately reflect the measurement instrument if reused over time [21]. To test reliability, a pretest was conducted on the employee questionnaire in December 2025, using a sample of (20) employees from the research population outside the sample. Cronbach's alpha was used to verify the reliability of the scales, and the overall reliability coefficient for the scale's domains was (0.90), which is considered acceptable in scientific research. Therefore, the questionnaire is considered a field-testable instrument, as a reliability score exceeding 70% indicates its suitability for data collection [20]. (190) questionnaires were distributed to the respondents, and data were collected in December 2025.

Results and Discussion

First: Identifying the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate.

level of role in the four areas ranged from (1.0 to 5.0) degrees. Respondents were divided into three categories: weak, moderate, and strong, according to the range law, as shown in Table 1.

The research results showed that the distribution of respondents according to the

Table 1. Distribution of respondents according to the level of role of agricultural extension marketing platforms in supporting crop production.

Field	Categories					
Platform Knowledge	Weak (1.00-2.33)		Medium (2.34-3.66)		Large (3.67-5.00)	
	No	%	No	%	No	%
	5	2.6	75	39.5	110	57.9
The Role of Platforms in Supporting Production	Weak (1.00-2.33)		Medium (2.34-3.66)		Large (3.67-5.00)	
	No	%	No	%	No	%
	2	1.1	59	31.1	129	67.9
Developing digital extension mechanisms	Weak (1.00-2.33)		Medium (2.34-3.66)		Large (3.67-5.00)	
	No	%	No	%	No	%
	1	0.5	55	29.0	134	70.5
Obstacles to Platform Use	Weak (1.00-2.33)		Medium (2.34-3.66)		Large (3.67-5.00)	
	No	%	No	%	No	%
	6	3.2	73	38.4	111	58.4

Table 1 shows that the role of agricultural extension marketing platforms in supporting crop production, from the perspective of farm workers in Baghdad Governorate, is largely understood by the majority of respondents. This indicates the effectiveness of digital extension marketing platforms in supporting agricultural production, and therefore the need

for workers to become aware of these platforms, use them effectively, and receive training on their use to benefit from the increasing use of electronic automation in light of rapid scientific advancements.

Secondly, the sub-objectives according to the research areas are as follows:

- 1- To identify the level of agricultural employees' knowledge of digital extension marketing platforms.

marketing platforms ranged from (1.0 to 5.0), with a mean of 3.92 and a standard deviation of 0.72. The percentages of the categories are: weak (2.6%), moderate (39.5%), and strong (57.9%), as shown in Table 2.

The research results showed that the respondents' knowledge of extension

Table 2: Distribution of respondents according to knowledge categories of digital extension marketing platforms.

Platform knowledge categories	No	%
Weak low(1.00-2.33)	5	2.6
Medium (2.34-3.66)	75	39.5
Strong (3.67-5.00)	110	57.9
Total	190	100

Table 2 shows that the level of agricultural employees' knowledge of digital extension marketing platforms is generally high, with the majority possessing a high level of knowledge

and a very small group possessing a low level. Table 3 shows that the overall mean score for the knowledge items is 3.82, with a general standard deviation of 0.77.

Table 3: Distribution of respondents according to their knowledge of digital extension marketing platforms.

s	paragraphs	average	deviation	%	Importance
1	I have a general understanding of extension marketing platforms and their uses.	3.88	0.74	77.6	Large
2	I have a good understanding of the basic features these platforms offer.	3.92	0.69	78.4	Large
3	I know how farmers access marketing information.	3.75	0.81	75.0	Medium
4	I understand how to connect farmers to markets through digital platforms.	3.68	0.85	73.6	Medium
5	I am familiar with the agricultural extension services provided by these platforms.	4.02	0.70	80.4	Large
6	I know the basic steps for using marketing platforms.	3.80	0.78	76.0	Medium
7	I keep up with the latest developments related to digital agricultural platforms.	3.57	0.90	71.4	Medium
8	I have knowledge of how to analyze the data provided by these platforms.	3.95	0.72	79.0	Medium

2- Identifying the level of the platforms' role in supporting agricultural production.

The scores for the level of the platforms' role in supporting agricultural production ranged from (1.0–5.0), with a mean of 4.01 and a

deviation of 0.71. The percentages of respondents were as follows: weak (1.0%), moderate (31.1%), and strong (67.9%), it must be separate, then table of values as shown in Table 4.

Table 4. Distribution of respondents across categories regarding the role of platforms in supporting agricultural production.

Platform Role Categories	Number	%
Weak low (1.00-2.33)	2	1.0
Medium (2.34-3.66)	59	31.1
Strong (3.67-5.00)	129	67.9
Total	190	100

Table 3 shows that the role of platforms in supporting agricultural production is very strong, and that most employees are in the high-level category, indicating the effectiveness of digital platforms in supporting

production. Table 5 shows that the overall mean for the items related to the role of platforms in supporting agricultural production is 4.00, with an overall standard deviation of 0.74.

Table 5: Distribution of respondents according to the items related to the role of platforms in supporting agricultural production.

s	paragraphs	The average	deviation	%	Importance
1	Platforms help determine the optimal timing for agricultural operations.	4.10	0.68	82.0	Large
2	Platforms contribute to improved agricultural planning for farmers.	3.95	0.72	79.0	Large
3	Platforms provide users with accurate information on fertilization and irrigation.	4.05	0.71	81.0	Large
4	Platforms help reduce losses resulting from poor agricultural planning.	3.88	0.80	77.6	Large
5	Platforms help improve the quality of production.	4.15	0.66	83.0	Large
6	Platforms connect farms directly to markets.	3.70	0.85	74.0	Medium
7	Platforms help in forecasting crop prices.	3.85	0.79	77.0	Large
8	Platforms provide climate information that aids in decision-making.	4.12	0.70	82.4	Large
9	Platforms improve the efficiency of agricultural production management.	3.90	0.82	78.0	Large
10	Platforms support increased agricultural production.	4.20	0.65	84.0	Large

3- Identifying the level of development of digital extension mechanisms and enhancing their role in improving the quality of agricultural production.

The research results showed that the respondents' scores in the area of developing digital extension mechanisms and enhancing

Table 6. Distribution of respondents according to categories of developing digital extension mechanisms and enhancing their role in improving the quality of agricultural production.

Categories of mechanism development	Number	%
Weak low (1.00-2.33)	1	0.5
Medium (2.34-3.66)	55	28.9
Strong (3.67-5.00)	134	70.6
Total	190	100

Table 6 shows that the development of digital agricultural extension mechanisms and their

their role in improving the quality of agricultural production ranged from (1.0 – 5.0), with a mean of 4.12 and a standard deviation of 0.68. The percentages in the three categories were: weak (0.5%), moderate (28.9%), and strong (70.6%), as shown in Table 6.

role in improving agricultural production quality reflect significant efforts in this area.

The majority of respondents scored highly, while those in the middle group indicated a need for expanded training and improved infrastructure.

Table 7 shows that the overall mean score for the items related to developing digital extension mechanisms was 4.04, with a standard deviation of 0.70.

Table 7: Distribution of respondents according to the items related to developing digital extension mechanisms and their role in improving agricultural production quality.

s	paragraphs	average	deviation	%	Importance
1	Developing interactive extension content enhances extension work.	4.18	0.66	83.6	Large
2	Updating software increases extension effectiveness.	4.05	0.70	81.0	Large
3	Providing training courses on digital extension.	4.00	0.72	80.0	Large
4	The shift towards e-extension reduces traditional effort.	3.92	0.78	78.4	Large
5	Adding data analytics tools improves decision-making.	3.85	0.82	77.0	Large
6	Linking platforms to a unified information system develops an extension.	4.10	0.68	82.0	Vary Large
7	Increasing internet speed raises extension efficiency.	4.22	0.64	84.4	Large
8	Updating market data within the platforms enhances marketing.	3.90	0.80	78.0	Large
9	Providing mobile applications contributes to the dissemination of digital extension.	4.15	0.67	83.0	Large

4- Identifying the obstacles employees face in using digital platforms.

The research results showed that the scores of the obstacles employees face in using digital platforms ranged from (1.0 to 5.0), with a mean of 3.65 and a deviation of 0.73. The percentages of the three categories were: weak (3.2%), moderate (38.4%), and significant (58.4%), as shown in Table 8.

mean of 3.65 and a deviation of 0.73. The percentages of the three categories were: weak (3.2%), moderate (38.4%), and significant (58.4%), as shown in Table 8.

Table 8. Distribution of respondents according to the categories of obstacles employees face in using digital platforms.

Categories of obstacles	Number	%
Weak low (1.00-2.33)	6	3.2
Medium (2.34-3.66)	73	38.4
Strong (3.67-5.00)	111	58.4
Total	190	100

Table 8 shows that while obstacles to employees using digital platforms exist, they are not severe. Most employees face moderate to significant challenges, such as weak

institutional support or insufficient training. Table 9 shows that the overall mean score for the obstacles is 3.83, with a standard deviation of 0.80.

Table 9: Distribution of respondents according to the obstacles employees face in using digital platforms.

s	paragraphs	average	deviation	%	Importance
1	Weak internet infrastructure hinders usage.	3.95	0.78	79.0	Large
2	Insufficient training reduces the effectiveness of platform use.	4.12	0.70	82.4	Large
3	Poor technical support in addressing technical issues.	3.85	0.81	77.0	Large
4	Limited time available for employees to use the platforms.	3.60	0.92	72.0	Medium
5	Difficulty in some technical platform functions.	3.75	0.87	75.0	Medium
6	Lack of institutional encouragement for using digital platforms.	4.00	0.73	80.0	Large
7	Lack of modern devices for some employees.	3.55	0.94	71.0	Medium

Third: Determining the correlation between the role of agricultural extension marketing platforms in supporting crop production from the perspective of agricultural employees in Baghdad Governorate and the independent factors (age, years of service, and educational qualification).

1- Age: The results showed that the age groups ranged from less than 30 to more than 50, with a mean of 3.95 and a deviation of 0.70. The respondents were divided into age groups (less than 30 years, 31–40, 41–50, and more than 50), as shown in Table 10.

Table 10. Distribution of age groups and their impact on the role of agricultural extension marketing platforms in supporting crop production from the respondents' perspective.

Categories of Age	Number	%	The average	Deviation
Under 30 years old	40	21.1	3.82	0.71
31–40 years old	60	31.6	3.95	0.69
41–50 years old	55	28.9	4.02	0.68
Over 50 years old	35	18.4	4.05	0.70

Table 10 shows that the relationship is significant (Pearson $r = 0.18$, $p < 0.05$) → a weak but statistically significant positive relationship.

from a minimum of 5 years to a maximum of 20 years, and they were divided into (less than 5 years, 5–10, 11–20, and more than 20 years), as shown in Table 11.

2- Years of Service: The results showed that the years of service of the respondents ranged

Table 11. Distribution of Years of Service Categories and Their Impact on the Role of Agricultural Extension Marketing Platforms in Supporting Crop Production from the Respondents' Perspective.

Categories Years of Service	Number	%	The average	Deviation
Under 5 years	30	15.8	3.78	0.75
5–10 years	50	26.3	3.88	0.70
11–20 years	70	36.8	3.97	0.68
Over 20 years	40	21.1	4.05	0.69
Total	190	100		

Table 11 shows that years of service have a significant and statistically significant positive impact. Pearson $r = 0.21$, $p < 0.05 \rightarrow$

3- Educational Qualification:

Table 12. Distribution of respondents across educational qualification categories and its impact on the role of agricultural extension marketing platforms in supporting crop production.

Categories Educational Qualification	Number	%	The average	Deviation
Diploma in Agriculture	25	13.2	3.68	0.75
Bachelor of Science in Agriculture	120	63.2	3.95	0.70
Master of Science in Agriculture	35	18.4	4.10	0.65
Doctor of Science in Agriculture	10	5.3	4.22	0.60

Table 12 shows the ANOVA $F = 5.62$, $p < 0.01 \rightarrow$ a statistically significant difference exists between educational qualifications and

Conclusions

1. Employees' level of knowledge of digital platforms is moderate, tending towards high.
2. The role of platforms in supporting production is strong and effective.
3. Developing digital agricultural extension mechanisms increases the effectiveness of extension.

Recommendations

The Ministry of Agriculture, represented by the Baghdad Governorate Agriculture Directorate, Department of Agricultural Extension and Training, should undertake the following:

1. Enhance continuous training programs for employees on using digital platforms.
2. Develop the internet infrastructure within agricultural departments.
3. Improve technical support for software and applications.

The results showed that the respondents' educational qualifications were (Diploma, Bachelor's, Master's, and Doctorate), as shown in Table 12.

the role of agricultural extension marketing platforms in supporting crop production from the respondents' perspective.

4. Obstacles exist but are relatively limited.
5. Age, years of experience, and educational qualifications influence the evaluation of the platforms' role.
6. The majority of employees fall within the high category in evaluating the platforms.

4. Activate a system for monitoring and evaluating the performance of digital agricultural extension.
5. Providing mobile applications linked to digital platforms.
6. Raising awareness among farmers about the importance of using digital platforms.

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