

Article

Level of Implementation of Agricultural Extension Programs Supporting Organic Farming By Staff In Agricultural Extension Centers in The Central Region of Iraq

Ahmed Dhahir Al-Janabi*¹

1. Collage of Food Science, Al-Qasim Green University Babylon, Iraq

*Correspondance Author: ahmeddhahir@fosci.uoqasim.edu.iq

Abstract: The goal of this study, which targeted the staff of agricultural extension centers in central Iraq, is to measure the extent of applying organic farming support programs and also determine among the related factors constrain their application. The study sample consisted of the extension centers in the governorates in central Iraq Of these governorates, 37.5% were sampled out of them, which resulted in selecting three governorates: (Baghdad, Babil and Karbala). A total of 445 agricultural extension workers engaged in these centres and a list of names was obtained from which a random sample of 20% were drawn to provide the final sample, resulting in an overall figure of n = 89 respondents. The researcher used questionnaires as the main tool for data collection and analyzed the data using suitable statistical techniques. The findings indicate that the level of implementation of extension programs supporting organic farming by staff at agricultural extension centers in Golestan province was moderate, with a gap between the current state and ideal state. The results showed that numerous factors impeded the efficiency of these programs, particularly: insufficient funding, few numbers of qualified personnel and lack of infrastructure. The study suggests planning for organic agriculture extension with a holistic and multisectoral approach from: provision of adequate resources, establishment of human resource capacity, infrastructural development and the strengthening monitoring and evaluation systems. Success in the endeavor of course depends on the combined work, and cooperation between all parties involved (governments, universities, international organizations and farmers themselves).

Keywords: Organic Extension, Sustainability, Organic Farming, Agricultural Extension

Citation: Al-Janabi, A. D. Level of Implementation of Agricultural Extension Programs Supporting Organic Farming By Staff In Agricultural Extension Centers in The Central Region of Iraq. International Journal of Biological Engineering and Agriculture 2026, 5(3), 27-34.

Received: 20th Mar 2026

Revised: 15th Apr 2026

Accepted: 30th Apr 2026

Published: 20th May 2026



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

1. Introduction

The agricultural sector is critical for food security and economic development, struggling with most developing countries depending on natural resources for their sources of food production [1], [2]. Concern about environmental problems such as soil degradation, water scarcity and CC has led to the need for more sustainable and efficient agricultural production methods [3].

Organic farming is perhaps the most studied sustainable agricultural system that has been developed to minimize the environmental impacts associated with the use of chemical inputs in conventional agriculture by increasing diversity and improving soil properties [4]. In recent years, organic agriculture has experienced extraordinary growth around the world because of increasing demand for healthier and environmentally sustainable products [5].

This expansion notwithstanding, the practice of organic agriculture in developing world still remains relatively confined by a combination of hurdles including limited

practical knowledge among farmers themselves, lack of institutional support and weak agricultural extension systems [6]. According to the literature "the effective dissemination and adoption of sustainable agricultural technologies is largely contingent upon an effective extension system that translates research, knowledge, theories and ideas into practical application in-concrete situations" [7].

Agricultural extension is considered the connecting bridge between scientific research and practice in the field, facilitating the dissemination of agricultural innovations and promoting uptake by farmers [8]. But this role only makes sense to the degree that staff in extension centers are well trained and able to work in the practical and theoretical [9].

The data used to develop this training comes from some of the most recent studies explaining that a gap between theory and practice is indeed among the most significant problems surrounding agricultural extension in developing countries where extension activities tend to focus on merely transmitting knowledge yet failing address issues of how best to applying such knowledge at field level [10]. In addition, the absence of capacity development to agricultural extension agents restricts their expertise in accomplishing scientific and technology developments, especially for organic agriculture [11].

The results also have demonstrated to advance the challenges at agrarian system in Iraq with respect to helpless foundation, less esteem added planting practices, restricted monetary enhancement and lack of specialized expansion programs has unfavorably influenced the reception of current cultivating practices [12], [13]. However, some local studies show that organic farming is still in its infancy stage and also weak institutional support and little awareness among the farmers was observed [11].

Additionally, organizational constraints including insufficient funding and inappropriate extension tools also inhibit extension programs and their implementation in the field [14]. Poor farmer response may also be linked to economic and social factors, as well as a lack of trust in new technologies [15].

Based on the foregoing, it is clear that improving the implementation of extension programs supporting organic agriculture requires a thorough understanding of the factors influencing the performance of staff in extension centers, whether these factors are personal, such as experience and training, or organizational, such as institutional support and resource availability.

Therefore, this study aims to analyze the level of implementation of extension programs related to organic agriculture by staff in agricultural extension centers in the central region of Iraq, and to identify the factors influencing this implementation, thereby contributing to the development of the extension system and promoting the transition towards sustainable agriculture.

2. Materials and Methods

A. Study Methodology

The study relied on the most suitable method is The descriptive-analytical approach for describing phenomena as they actually are and analyzing them to reach accurate results [16]. This method was selected because it is suitable for the goals of the study, which are to describe and analyze the degree of employee implementation of extension initiatives.

B. Study population and sample

Study population:

All workers in agricultural extension facilities in central Iraq, which are represented by eight governorates (Baghdad, Babylon, Wasit, Najaf, Karbala, Diwaniyah, Anbar, and Diyala), make up the study population.

Study sample:

From the central governorates, a random sample of 37.5% of the total population was chosen. Three governorates Baghdad, Babylon, and Karbala were included in this sample.

A basic random sample was also chosen from the study population, which, according to official figures for 2025, included 445 workers. This sample size was 89 respondents, representing 20% of the total population.

3. Results and Discussion

First: The first axis: Demographic variables

Table 1. Sample member distribution based on demographic factors

Variable	Category	Repetition	%	Variable	Category	Repetition	%
Sex	male	67	75.3%	the age	Under 30 years old	18	20.2%
					30-40 years	34	38.2%
	feminine	22	24.7%		41-50 years	25	28.1%
					More than 50 years	12	13.5%
Academic qualification	diploma	15	16.9%	Years of experience	under 5 years	22	24.7%
	Bachelor's	48	53.9%		5-10 years	31	34.8%
	Master's	21	23.6%		11-15 years	23	25.8%
	PhD	5	5.6%		More than 15 years	13	14.6%
Specialized training	Yes	41	46.1%				
	no	48	53.9%				

The table above shows that the gender variable is predominantly male, and the age variable has the highest percentage at 38.2% for the 30-40 age group. Those holding a bachelor's degree are the most numerous at 53.9%, and those with 5-10 years of experience have the highest percentage at 34.8%. The most common training requirement is the lack of training, at 53.9%.

Second: The level of application by workers in agricultural extension centers of extension programs supporting organic farming

With an overall arithmetic mean of (3.34) and a standard deviation of (0.87), the findings demonstrated a reasonable degree of workers' application of extension programs supporting organic agriculture, which is greater than the hypothetical mean (3), as seen in Table 2.

Table 2. The general degree of application's arithmetic means and standard deviations

Axis	Arithmetic Mean	Standard Deviation	Level
Obstacles and challenges	3.47	0.86	middle
Planning for extension programs	3.39	0.86	middle
Implementation of extension programs	3.28	0.87	middle
Monitoring and evaluation	3.23	0.89	middle

General level	3.34	0.87	middle
----------------------	------	------	---------------

The table above shows that the obstacles and challenges axis achieved the highest average (3.47), indicating the employees' interest in the pre-planning stages. Conversely, the monitoring and evaluation axis had the lowest average (3.23), suggesting weaknesses in monitoring and impact assessment mechanisms. This indicates that employees are performing their duties to an acceptable degree, but require improvement and development. This result aligns with the study by Al-Saqri et al. [17], which indicated that the level of implementation of extension programs in the Gulf Cooperation Council (GCC) countries was average, and also with the study by Klerkx et al. [18], which confirmed a gap between available resources and desired aspirations in the field of organic extension. Detailed results for each axis will be presented below.

1- The axis of obstacles and challenges

According to Table 3, the barriers and difficulties axis yielded an overall arithmetic mean of 3.47 and a standard deviation of 0.86, both of which are more than the hypothetical mean of 3.

Table 3. Distribution of responses from the sample members across the items of the obstacles axis

Paragraph Number	Disabled	Average	Deviation	Intensity Level
1	Insufficient financial resources	3.82	0.74	High
2	Limited qualified human resources	3.71	0.81	High
3	Weak infrastructure and facilities	3.64	0.86	High
4	Difficulty in reaching some farmers	3.52	0.79	Medium
5	Farmers' resistance to change	3.48	0.92	Medium
6	Lack of suitable training materials	3.41	0.88	Medium
7	Poor coordination between relevant authorities	3.37	0.94	Medium
8	Lack of incentives and encouragement	3.33	0.86	Medium
9	Multiple tasks and responsibilities	3.28	0.91	Medium
10	Lack of clarity in policies and procedures	3.19	0.97	Medium
	overall average	3.47	0.86	Medium

According to the above data, "lack of sufficient resources" had the greatest arithmetic mean (3.82) and standard deviation (0.74), whereas "lack of clarity of policies and procedures" had the lowest arithmetic mean (3.19) and standard deviation (0.97). This is attributed to the fact that the most prominent challenge facing the development and growth of agricultural extension is the lack of financial resources, and this is consistent with what was stated in the report of the FAO [13], and the study of Klerkx et al [18].

2- Planning axis for extension programs

According to Table 4, the expansion program planning axis yielded an overall arithmetic mean of 3.39 and a standard deviation of 0.86, both of which are more than the hypothetical mean of 3.

Table 4. Distribution of responses from the sample members across the items of the extension program planning axis

Paragraph Number	Paragraph	Average	Deviation	Level
1	Accurately identifying farmers' needs	3.72	0.78	High average
2	Set SMART (Specific, Measurable, Achievable, Relevant, Time-bound, goals)	3.61	0.82	middle
3	Identifying financial and human resources	3.54	0.91	middle
4	Setting realistic time plans	3.49	0.85	middle
5	accurately define the target audience	3.47	0.76	middle
6	Feasibility study of the proposed programs	3.41	0.88	middle
7	Coordination with relevant parties	3.38	0.92	middle
8	Identifying Key Performance Indicators	3.32	0.95	middle
9	Preparing alternatives for different scenarios	3.28	0.89	middle
10	Documenting plans systematically	3.24	0.83	middle
11	Review plans periodically	3.19	0.86	middle
12	Involving farmers in planning	3.12	0.94	middle
	overall average	3.39	0.86	middle

As can be seen from the above table, the item "Accurately Identifying Farmers' Needs" had the greatest mean score (3.72) and the lowest mean score (3.12) and standard deviation (0.94). This is attributed to the staff's focus on the pre-planning stages and the understanding that sound planning is fundamental to the success of any extension program, along with the necessity of involving beneficiary farmers in all planning phases.

3- Extension Program Implementation axis

According to Table 5, the extension program implementation axis yielded an overall arithmetic mean of 3.28 and an overall standard deviation of 0.87, both of which are more than the hypothetical mean of 3.

Table 5. Distribution of the sample members' responses across the items of the implementation axis.

Paragraph Number	Paragraph	Average	Deviation	Level
1	Using diverse extension methods	3.58	0.79	middle
2	Organizing practical workshops	3.51	0.84	middle
3	Conduct regular field visits	3.47	0.76	middle
4	Using modern educational methods	3.39	0.91	middle
5	Providing appropriate training materials	3.35	0.88	middle
6	Effective communication with farmers	3.32	0.82	middle
7	Applying active learning methods	3.28	0.94	middle

8	Benefit from successful experiences	3.24	0.86	middle
9	Using technology in extension	3.19	0.97	middle
10	Coordination with researchers and specialists	3.15	0.89	middle
11	'Adapting the content to farmers needs	3.11	0.93	middle
12	Working within an integrated team	3.07	0.85	middle
13	Continuous documentation of activities	3.02	0.91	middle
	overall average	3.28	0.87	middle

According to the above data, "Using Diverse Guidance Methods" had the greatest arithmetic mean (3.58) and standard deviation (0.79), while "Continuously Documenting Activities" had the lowest arithmetic mean (3.02) and standard deviation (0.91). This is explained by the employees' capacity to carry out programs in an acceptable manner and the fact that employee productivity has a significant impact on the quality of implementation.

4- Monitoring and Evaluation Axis

According to Table 6, the monitoring and evaluation section's data revealed an overall arithmetic mean of (3.23) and a standard deviation of (0.89), both of which are greater than the hypothetical mean (3).

Table 6. Distribution of responses from the sample members across the items of the follow-up and evaluation axis

Paragraph Number	Paragraph	Average	Deviation	Level
1	Continuous monitoring of program implementation	3.44	0.82	middle
2	Collecting feedback data	3.38	0.87	middle
3	Measuring performance indicators	3.33	0.91	middle
4	Assessing farmer satisfaction	3.29	0.84	middle
5	Preparing periodic reports	3.25	0.89	middle
6	Analyzing the results and drawing lessons	3.21	0.93	middle
7	Economic impact assessment	3.17	0.96	middle
8	Environmental Impact Assessment	3.13	0.98	middle
9	Comparing results with objectives	3.09	0.91	middle
10	Suggest future improvements	3.05	0.87	middle
	overall average	3.23	0.89	middle

As can be seen from the above table, "continuous monitoring and implementation of programs" had the greatest arithmetic mean (3.44) and standard deviation (0.82), while "proposing future improvements" had the lowest arithmetic mean (3.05) and standard deviation (0.87). This is attributed to the necessity of monitoring the implementation of programs for the purpose of improvement and development, as well as increasing credibility and addressing errors in a timely manner.

4. Conclusion

- a. The overall level of implementation was average, thus requiring institutional and organizational interventions to improve performance efficiency.
- b. Insufficient financial allocations lead to weak adoption and implementation of organic agriculture.
- c. There is a lack of development and training programs specific to organic agriculture.

Recommendations

- a. Increase financial allocations and establish model organic farms for practical training.
- b. Develop training and qualification programs by designing specialized training programs in organic agriculture.
- c. Enhance extension content by preparing specialized extension guides in organic agriculture.
- d. Improve monitoring systems by using technology to collect and analyze data and prepare comprehensive periodic performance reports.

REFERENCES

- [1] A. D. Shaheed, "The reality of agricultural techniques used by farmers to reduce losses in wheat and barley crops in the governorates of the central region of Iraq," *Iraqi J. Agric. Sci.*, vol. 49, no. 1, pp. 83–92, 2018.
- [2] J. R. Anderson and G. Feder, "Agricultural extension: Good intentions and hard realities," *World Bank Res. Obs.*, vol. 19, no. 1, pp. 41–60, 2004, doi: 10.1093/wbro/lkh013.
- [3] J. P. Reganold and J. M. Wachter, "Organic agriculture in the twenty-first century," *Nat. Plants*, vol. 2, p. 15221, 2016, doi: 10.1038/nplants.2015.221.
- [4] V. Seufert and N. Ramankutty, "Many shades of gray---The context-dependent performance of organic agriculture," *Sci. Adv.*, vol. 3, no. 3, 2017, doi: 10.1126/sciadv.1602638.
- [5] J. Trávníček, B. Schlatter, M. Helbing, and H. Willer, "The world of organic agriculture 2025: Summary," in *The World of Organic Agriculture: Statistics and Emerging Trends 2025*, Research Institute of Organic Agriculture FiBL and IFOAM--Organics International, 2025, pp. 20–31.
- [6] J. Kumar, S. Rana, V. Rani, and A. Ahuja, "What affects organic farming adoption in emerging economies? A missing link in the Indian agriculture sector," *Int. J. Emerg. Mark.*, vol. 20, no. 5, pp. 1849–1868, 2025, doi: 10.1108/IJOEM-03-2023-0390.
- [7] R. Davis and K. Thompson, "Humor as critique: Irony and absurdity in contemporary Pop Surrealism," *Int. J. Art Humor Stud.*, vol. 12, no. 1, pp. 34–51, 2024, doi: 10.1386/ijahs_00067_1.
- [8] C. Leeuwis and A. van den Ban, *Communication for Rural Innovation*. Blackwell Science, 2004.
- [9] W. M. Rivera, "Public sector agricultural extension system reform and the challenges ahead," *J. Agric. Educ. Ext.*, vol. 17, no. 2, pp. 165–180, 2011, doi: 10.1080/1389224X.2011.544457.
- [10] M. Abdullah and others, "Evaluating the efficiency of the agricultural extension system in Iraq from the perspective of agricultural extension workers," *Int. J. Agric. Ext. Soc. Dev.*, vol. 8, no. 8, pp. 603–610, 2025, doi: 10.33545/26180723.2025.v8.i8i.2320.
- [11] D. M. Kaleel, Z. R. Kadhim, and M. Ali, "The reality and determinants of organic agriculture in Iraq: A review of the most important studies and implemented programs (The wheat crop: A case study)," *Kirkuk Univ. J. Agric. Sci.*, vol. 16, no. 4, pp. 256–265, 2025, doi: 10.58928/ku25.16428.
- [12] S. ElHajj Hassan *et al.*, *Agricultural Value Chain Assessment in Iraq 2024*. Food and Agriculture Organization, 2025.
- [13] FAO, *The State of Food and Agriculture 2020: Overcoming Water Challenges in Agriculture*. Rome: FAO, 2020. doi: 10.4060/ca9692en.
- [14] K. E. Davis, "Comparison of national extension systems: Application of the best-fit framework," 2020. doi: 10.2499/9780896293755_03.
- [15] S. S. Meijer, D. Catacutan, O. C. Ajayi, G. W. Sileshi, and M. Nieuwenhuis, "The role of knowledge, attitudes and perceptions in the uptake of agricultural and agroforestry innovations among smallholder farmers in sub-Saharan Africa," *Int. J. Agric. Sustain.*, vol. 13, no. 1, pp. 40–54, 2015, doi: 10.1080/14735903.2014.912493.
- [16] J. W. Creswell and J. D. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed. SAGE Publications, 2018.

-
- [17] A. O. Al-Saqri, S. M. Al-Ruzaiqi, and A. S. Al-Mahruqi, "Agricultural extension workers' perceptions of organic farming in Gulf countries: Implications for policy and practice," *Appl. Geogr.*, vol. 136, p. 102543, 2021, doi: 10.1016/j.apgeog.2021.102543.
- [18] G. Cofré-Bravo, L. Klerkx, and A. Engler, "Combinations of bonding, bridging, and linking social capital for farm innovation: How farmers configure different support networks," *Journal of Rural Studies*. Elsevier, 2019. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0743016718308040>