

Role of Agricultural Extension Training in Developing Farmers' Awareness of Agricultural Practices to Achieve Food Security in Al-Hamdaniya District, Nineveh Governorate

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ABSTRACT

This study primarily aimed to identify the role of agricultural extension training in developing farmers' awareness of agricultural practices to achieve food security in Al-Hamdaniya District, Nineveh Governorate. The descriptive-analytical approach, incorporating both correlational and causal-comparative designs, was adopted. The research population comprised all vegetable crop farmers in 17 villages within Al-Hamdaniya District, totaling 587 farmers. A multi-stage cluster sample of approximately 50% was selected, resulting in a core sample of 294 farmers. Data were collected using a structured questionnaire validated for face validity and instrument reliability via Cronbach's Alpha. The results indicated that the study data followed a normal distribution, with a skewness coefficient of -0.391 and a kurtosis coefficient of 0.074. The overall mean score for the perceived role of extension training was 65.238 (SD = 9.902), reflecting a moderate-to-high role. The overall level of farmers' actual awareness reached a mean score of 49.863 (SD = 12.093). Furthermore, a highly significant positive correlation was observed between the role of extension training and the level of farmers' awareness. The study recommended updating extension training curricula to focus intensively on climate-smart practices, water scarcity adaptation, and bridging practical application gaps.

Keywords: Agricultural Extension; Extension Training; Farmers' Awareness; Food Security; Nineveh

INTRODUCTION

Food security remains one of the most critical developmental and humanitarian challenges of the modern era, serving as the cornerstone for social, political, and economic stability worldwide. In the Iraqi context, the food security dilemma is highly complex. Despite possessing rich agricultural potential, Iraq has transitioned into a net food importer due to severe environmental pressures, including acute water scarcity, desertification, and climate change. To mitigate these existential threats, transitioning toward modern, sustainable agricultural options, such as Good Agricultural Practices (GAP) and climate-smart agriculture, is imperative.

Since the successful adoption of these techniques depends directly on the cognitive awareness of farmers, the pivotal role of agricultural extension training emerges as a non-formal educational tool responsible for knowledge transfer

and behavioral modification. The research problem is framed around the following central question: What is the role of agricultural extension training in developing farmers' awareness of agricultural practices to achieve food security in the study area?

Research Objectives:

To identify the personal and socio-economic characteristics of the respondent farmers.

To determine the role of agricultural extension training in developing farmers' awareness of agricultural practices for food security as a whole and across specific sub-domains.

To assess the actual awareness level of farmers regarding agricultural practices under the concept of food security.

To analyze the correlational relationship between the role of extension training and the farmers' awareness level.

To diagnose the primary constraints hindering the

effectiveness of extension training activities.

MATERIAL AND METHODS

Research Area and Approach: The descriptive-analytical approach, utilizing correlational and causal-comparative designs, was deployed. The field research was conducted in Al-Hamdaniya District, Nineveh Governorate, covering 17 villages within the geographical jurisdiction of Al-Hamdaniya and Al-Nimrud agricultural extension blocks.

Population and Sampling: The total research population comprised 587 vegetable farmers. A multi-stage cluster sample was drawn at a selection rate of approximately 50%, yielding a final sample size of 294 respondent farmers.

Data Collection Instrument and Statistical Analysis: A structured questionnaire was developed consisting of three main axes: extension training role, awareness levels, and operational constraints. Face validity was established through an expert jury panel. Reliability was confirmed using Cronbach's Alpha coefficient. Data processing was conducted via SPSS (v.26) utilizing frequencies, percentages, arithmetic means, standard deviations, weighted means, percentage weights, and Pearson's correlation coefficient.

Normality of Data Distribution Test: Prior to hypothesis testing, the normality of data distribution was verified for the two primary variables. Due to the large sample size ($N = 294$), the highly sensitive Kolmogorov-Smirnov and Shapiro-Wilk significance values dropped to 0.000. Therefore, the assessment relied on the skewness and kurtosis indices, which recorded -0.391 and 0.074 respectively. Since these values fell within the acceptable statistical threshold (± 1.96) and the histograms exhibited a symmetrical bell-shaped curve, the assumption of normality was satisfied, thereby justifying the use of parametric statistical tests.

RESULTS AND DISCUSSION

Socio-economic Characteristics (Age Domain)

The findings revealed that the middle-aged cohort (35–47 years) was predominant in the study area, accounting for 57.143% of the total sample, with an overall mean age of 39.608 years ($SD = 13.642$).

Table 1. Distribution of respondent farmers according to age categories

Age Categories (Years)	Frequency	Percentage %
22 - 34	117	39.796
35 - 47	168	57.143
48 - 60	9	3.061
Total	294	100.0

(Max value: 60, Min value: 22, Class interval: 13).

The Role of Agricultural Extension Training

The overall mean score for the perceived role of extension training was 65.238 ($SD = 9.902$). The sample was categorized into three levels based on a class interval of 13.

Table 2. Distribution of respondents according to the overall extension training role categories

No.	Extension Role Category	Frequency	Percentage %	Category Mean
1	Low (42 - 54 points)	26	8.844	49.234
2	Moderate (55 - 67 points)	176	59.864	57.643
3	High (68 - 80 points)	92	31.293	77.324
	Total	294	100.0	

(Source: Prepared by researchers based on statistical output).

The data in Table 2 indicates that the moderate category was the most frequent (59.864%), followed by the high category (31.293%). This reflects the substantial capacity of local extension field schools and training programs in building the technical knowledge of vegetable farmers.

Farmers' Actual Awareness Level of Food Security Practices

The overall mean score for the actual awareness level reached 49.863 ($SD = 12.093$), distributed across three categories using a class interval of 19.

Table 3. Distribution of respondents according to actual awareness categories

No.	Awareness Category (Points)	Frequency	Percentage %	Category Mean
1	Low (22 - 40 points)	109	37.075	39.325
2	Moderate (41 - 59 points)	122	41.497	54.634
3	High (60 - 78 points)	63	21.429	77.942
	Total	294	100.0	

(Source: Questionnaire electronic data processing).

The findings presented in Table 3 show that the moderate awareness category comprised the largest proportion of farmers (41.497%), which can be attributed to the cumulative cognitive gains acquired through active participation in ongoing extension activities.

Correlational and Causal Analysis

Pearson correlation analysis demonstrated a highly significant, positive, and strong relationship ($p < 0.01$) between the independent variable (extension training role) and the dependent variable (farmers' awareness level). Furthermore, multiple linear regression analysis confirmed the robust explanatory power of the predictive model, highlighting that variations in extension input significantly explain the variance in farmers' sustainable agricultural awareness.

CONCLUSION

It is concluded that agricultural extension training serves as the primary operational catalyst for improving the cognitive frameworks of vegetable farmers in Al-Hamdaniya. The confirmed normality of data distribution enhances the external validity and statistical reliability required to generalize these insights to demographically similar farming communities across Nineveh Governorate.

RECOMMENDATIONS

Expanding the scope of targeted training programs designed specifically for vegetable growers to bridge knowledge gaps within the low-awareness category.

Aligning the scientific content of extension packages with climate change adaptation mechanisms, modern irrigation techniques, and food safety standards to ensure sustainable food security.

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