

ANALYSIS OF AGRICULTURAL EXTENSION FACTORS IN
ENHANCING FOOD SECURITY POLICIES IN JORDAN

تحليل عوامل الإرشاد الزراعي في تعزيز سياسات الأمن الغذائي في
الأردن



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الملخص

تهدف هذه الدراسة إلى تحليل دور الإرشاد الزراعي في دعم سياسات الأمن الغذائي من خلال تقييم مستوى معارف العاملين في مديرية زراعة عمان، وتحديد مصادر المعلومات، وقياس فعالية برامج الإرشاد، وتحديد التحديات، واقتراح حلول لتحسين الأداء. أظهرت النتائج أن 50% من الإداريين تزيد أعمارهم عن 41 عاماً ولديهم أكثر من 19 عاماً من الخبرة، وأن 56.7% من العاملين في الإرشاد الزراعي يحملون شهادة جامعية. ركز التدريب على الحفاظ على المياه (حتى 40%) وسلامة الغذاء (حتى 33.4%). مع أعلى درجات المعرفة في إدارة الموارد المائية (2.59) وأقل الدرجات في ضبط السوق (2.33). تميزت مؤسسات الدولة في تنفيذ سياسات الأمن الغذائي، بمساهمة أعلى من الإرشاد الزراعي في التمويل (2.5 مقابل 1.93). وجود الغذاء (2.55 مقابل 2.05)، والمياه والزراعة المستدامة (2.5 مقابل 2.2). برزت التحديات الرئيسية في متطلبات الإنتاج (43.2%)، والبنية التحتية، والمياه (36.6%). في المقابل، كان للتحديات الطبيعية الأثر الأكبر (2.34)، مع وجود ارتباطات مهمة بين الإرشاد الزراعي ومعوقات مثل الوصول إلى المعلومات (**0.333) ومتطلبات الإنتاج (**0.344). توصي الدراسة بتعزيز دور الإرشاد الزراعي وتطوير برامج التدريب والتأهيل لتلبية متطلبات تحقيق الأمن الغذائي. كما تدعو إلى تكثيف الوعي والتنسيق بين الجهات المعنية، بالإضافة إلى تعزيز الدعم المؤسسي والمالي، لما لهما من أهمية بالغة في تذليل العقبات وتعزيز فعالية السياسات.

ABSTRACT

This study aims to analyze the role of agricultural extension in supporting food security policies by assessing the level of knowledge of employees in the Amman Agriculture Directorate, identifying information sources, measuring the effectiveness of extension programs, identifying challenges, and proposing solutions to improve performance. Results showed that 50% of administrators were over 41 years old and had more than 19 years of experience, and that 56.7% of agricultural extension workers held a university degree. Training focused on water conservation (up to 40%) and food safety (up to 33.4%), with the highest knowledge scores in water resource management (2.59) and the lowest scores in market control (2.33). State institutions excelled in implementing food security policies, with a higher contribution than agricultural extension in financing (2.5 versus 1.93), food quality (2.55 versus 2.05), and water and sustainable agriculture (2.5 versus 2.2). The main challenges emerged in production requirements (43.2%), infrastructure, and water (36.6%). In contrast, natural challenges had the greatest impact (2.34), with significant correlations between agricultural extension and constraints such as access to information (0.333**) and production requirements (0.344**). The study recommends strengthening the role of agricultural extension and developing training and qualification programs to meet the requirements of achieving food security. It also calls for intensifying awareness and coordination among relevant stakeholders, in addition to strengthening institutional and financial support, as they are of paramount importance in overcoming obstacles and enhancing policy effectiveness.

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Analysis Of Agricultural Extension Factors in Enhancing Food Security Policies in Jordan

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Abstract

This study aims to analyze the role of agricultural extension in supporting food security policies by assessing the level of knowledge of employees of food security in the Amman Municipality, as well as identifying information sources, measuring the effectiveness of extension programs, identifying challenges, and finally proposing solutions to improve performance. Accordingly, results showed that 50% of administrators in agricultural extension were over 41 years old and had more than 13 years of experience, and that 56.7% of agricultural extension workers held a university degree. Regarding training, it focused on water conservation (up to 40/100) and food safety (up to 33.4%), with the highest knowledge scores in water resource management (2.59) and the lowest scores in market control (2.33). Furthermore, state institutions excelled in implementing food security policies, with a higher contribution than agricultural extension in financing (2.5 versus 1.93), food quality (2.55 versus 2.05), and in water and sustainable agriculture (2.5 versus 2.2). In terms of challenges, the main challenges emerged in production requirements (43.2%), infrastructure, and water (36.6%). In contrast, natural challenges had the greatest impact (2.34), while significant correlations between agricultural extension and constraints such as access to information (0.333**) as well as production requirements (0.344**). Consequently, the study recommends strengthening the role of agricultural extension and developing training and qualification programs to meet the requirements of achieving food security. Moreover, it calls for intensifying awareness and coordination among relevant stakeholders, in addition to strengthening institutional and financial support, as these are of paramount importance in overcoming obstacles and enhancing policy effectiveness.

Key words: Farmer empowerment, institutional support, sustainable development, agricultural awareness, institutional integration, agricultural challenges, Food security, Agricultural extension

Introduction

Food security is a fundamental pillar of national security. However, Jordan faces strategic challenges related to population growth, resource scarcity, and dependence on imports, making it vulnerable to market fluctuations and climate change, despite agricultural expansion and increased production and exports (Shens et al., 2015; Idris, 2016). Within this framework, Jordan has made progress in achieving food security by 2022, despite persistent challenges related to food waste, weak legislation, and high production costs (Ghanayem et al., 2025).

Given these challenges, agricultural extension is a pivotal tool in supporting food security and sustainable development policies by empowering farmers and encouraging innovation to address climate change (Prajapati et al., 2025). It is worth noting that this extension service has evolved in Jordan since 1954 and underwent an organizational transformation in 2018, separating its services from scientific research (Dhehibi et al., 2017). Furthermore, in 2023, more than 60 extension programs, 30 field schools, pest control campaigns, and training were implemented in partnership with international organizations such as the Food and Agriculture Organization (FAO), benefiting hundreds of engineers and farmers (Khalaf & Al-Mashhadani, 2023).

Furthermore, agricultural extension not only increases productivity but also stimulates economic growth by supporting value chains and achieving food security through improved resource utilization, developing producer capacities, and integrating modern technologies into agriculture, such as smart systems and climate-resilient practices (Anber et al., 2025; Ghanayem & Mohd Nor, 2025). Agricultural extension can also contribute to reducing food waste, enhancing food diversity, and building effective public-private partnerships, thus consolidating the concepts of the circular economy and sustainable agricultural development (El-Dukheri & Amer, 2024).

In light of the above, food security is a strategic priority in national policies, given its intertwined social, economic, and environmental dimensions. This is particularly important in developing countries, such as Jordan, which face increasing challenges, including water scarcity, climate change, and high dependence on food imports. Hence, the need for effective policy implementation tools to achieve the Sustainable Development Goals (SDGs) is highlighted. In this context, agricultural extension is one of the most prominent of these tools, given its role in disseminating knowledge, building capacity, and transferring technology to rural communities, contributing to improved agricultural productivity and enhanced food security (Baig et al., 2019).

With regard to Jordan specifically, agricultural extension is clearly a strategic tool for promoting food security policies and sustainable economic development. For example, Tarawneh et al., (2022) highlight the importance of strengthening extension services for small farmers through institutional cooperation and financial and technical support, while Tarawneh and Al-Najjar (2023) recommend using agricultural loans to improve water resource management and agricultural productivity to enhance sustainability. Abo Znemah et al., (2023) also explain that food security is influenced by socioeconomic factors such as household income and expenditure, emphasizing the role of extension in guiding agricultural practices toward efficiency and sustainability. Similarly, Abu Harb et al., (2024a) call for the development of comprehensive educational programs that take into account socioeconomic diversity to enhance rural youth empowerment, while Abu Harb et al., (2024b), Al-Lataifeh et al., (2024), and Dayoub et al., (2023) highlight the importance of strengthening agricultural extension services for small farmers. Furthermore, Dayoub et al., (2024) argue that smart technology is important in supporting productivity and sustainability, expanding the scope of extension to include digital innovation. In the same vein, Al Tarawneh et al., (2025) support this view by emphasizing the need to integrate policies and investment in research and development

within the bioeconomy framework, which enhances the effectiveness of agricultural extension in achieving food security and long-term economic development.

Statement of Problem

The study's problem is the limited effectiveness of agricultural extension in Jordan in supporting food security policies, despite its strategic importance. The results indicate gaps in the level of knowledge of food security professionals, varying effectiveness of training programs, and the emergence of structural challenges such as production requirements, lack of infrastructure, and water scarcity. Natural obstacles and difficulty accessing information also affect the ability of agricultural extension to achieve its objectives, necessitating addressing these gaps to enhance its role in agricultural development and food security.

Significance

The importance of this study lies in highlighting the pivotal role of agricultural extension as a strategic tool for achieving food security and sustainable development in Jordan, by assessing its current reality and identifying its strengths and weaknesses. Its findings contribute to guiding decision-makers and relevant institutions to develop training programs, institutional and financial support, and enhancing coordination among relevant parties to achieve optimal resource utilization. This enhances farmers' ability to address climate and economic challenges, thereby raising the efficiency of national food security policies.

Objectives

This study aims to explore the role of agricultural extension in supporting food security policies by measuring the level of knowledge of employees at the Amman Agriculture Directorate, identifying the entities responsible for providing relevant information, and analyzing the relationship between the implementation of extension programs and the achievement of policy objectives. It also aims to identify the most prominent challenges that hinder the effectiveness of agricultural guidance and propose ways to address them.

Method of Research

This research relies on the comparative approach as an analytical framework to understand the similarities and differences between agricultural extension and state institutions in supporting food security policies. This approach aims to highlight the differences in roles, implementation mechanisms, and the extent of contribution to achieving the objectives of these policies, helping to reach clearer and more accurate conclusions. State institutions here refer to governmental agencies concerned with food security, such as ministries, directorates, and public bodies that are responsible for formulating policies and implementing programs related to financing, quality control, water resource management, and sustainable agriculture.

- Population and Sample

The study targeted agricultural extension workers and administrators working in the Jordanian agricultural sector, whose tasks vary between providing technical guidance and participating in implementing agricultural policies. A purposive sample of 60 participants was selected from the Directorate of Agriculture in Amman Governorate, given its strategic importance in implementing agricultural policies. The sample included (30) agricultural extension workers (No agent is less than a bachelor's degree), and (30) administrators, taking into account diversity in demographic and professional characteristics such as age, academic qualifications, years of experience, and type of training.

Research procedures

- Data Collection

A questionnaire was used, conducted through a personal interview, and included topics related to personal and professional characteristics, level of knowledge of policies, the entities responsible for their implementation, and challenges and ways to overcome them. Data were collected between October and December 2024. The questionnaire was developed based on local and international literature and reviewed by a number of experts to ensure the validity of

the tool and its content. Results of the reliability test using Cronbach's alpha coefficient showed values ranging from 0.79 to 0.88, indicating the reliability of the tool.

- Measured Variables

This study measured personal variables such as age (measured in years according to specific age groups) and educational qualifications (secondary, diploma, bachelor's), as well as professional variables such as the number of years of experience (divided by time group), in addition to the type of training courses the participants attended, which were categorized into four main categories. Food security policies knowledge was assessed as a quantitative and qualitative variable using three levels (high, medium, and low) according to a coding scale (3, 2, and 1). The entities responsible for providing information were selected from a pre-defined list and digitally coded for analysis. Challenges and obstacles were categorized into legislative, funding, regulatory, production requirements, and difficulty obtaining information and measured using a five-point coding scale. Thus, the study included independent variables (age, qualifications, experience, type of training, and responsible entity) and dependent variables (level of knowledge and type of challenges) to clarify the relationships and patterns associated with agricultural extension effectiveness.

- Statistical Analyses

Data extracted from the questionnaire were analyzed using SAS (2012) software. Descriptive statistics (frequencies, percentages, means, standard deviations, and weighted means) were applied to prioritize policies and measure participants' attitudes. Pearson's correlation test was used to examine the relationship between agricultural extension variables (experience, type of training, and responsible agency) and institutional constraints or challenges associated with supporting food security policies. The statistical significance level was set at $P < 0.05$ and $P < 0.01$ to ensure the robustness of the results.

- Likert Scale Use

The study relied on a multi-level Likert scale to code the qualitative variables. The level of knowledge of food security policies was assessed at three levels (high, medium, low), with codes (3, 2, 1) to measure the intensity of perception and awareness. A five-point coding scale was also used to classify challenges and obstacles (legislative, financing, regulatory, production requirements, difficulty obtaining information), with each number on the scale reflecting the severity or frequency of the challenge as perceived by the participant. This procedure enabled the responses to be converted into quantitative data amenable to comparative statistical analysis across agricultural extension agencies and state institutions.

Results

Demographics of agricultural extension workers and administrators

Table 1 shows that the majority of agricultural extension and management personnel are older, with university qualifications prevalent among extension workers, while intermediate qualifications predominate among administrators. In addition, administrators have more experience and have completed training courses focused on water conservation and food safety, with varying levels of interest in other training areas.

Table (1): Demographic and professional distribution of agricultural guides and administrators according to the studied categories

Category	Classification	Agricultural Extension Workers (Nu.)	(%)	Agricultural Administrators (Nu.)	(%)
Age	20–30 years	8	26.6	9	30.0
	31–40 years	10	33.4	6	20.0
	41 years and over	12	40.0	15	50.0
Educational Qualification	Intermediate (Secondary education)	11	36.6	16	53.3
	University	17	56.7	14	46.7
	Postgraduate	2	6.7	–	–

Category	Classification	Agricultural Extension Workers (Nu.)	(%)	Agricultural Administrators (Nu.)	(%)
Years of Experience in Agricultural Extension	2–12 years	12	40.0	4	13.4
	13–22 years	8	6.7	15	50.0
	Over 22 years	10	33.4	11	36.6
Training Courses	Food Safety and Health	10	33.4	9	30.0
	Reduction Food loss	3	10.0	5	16.6
	Water conservation	11	36.6	12	40.0
	Safety and hygiene	6	20.0	4	13.4

Participants' Level of Knowledge of Agricultural and Food Policies

Table 2 shows that level of participants' knowledge of agricultural policies varied, with high awareness of policies related to food security and weak awareness in areas such as water resource regulation and market monitoring, highlighting the need for improved awareness and specialized training.

Table (2): Participants' Level of Knowledge of Food Security-Related Policies

Policy Focus	Policy	High (%)	Medium (%)	Poor (%)	Weighted Average	Ranking
Social Security Policies	Improving Jordan's food security and reducing dependence on imports	75.0	20.0	5.0	2.70	1
	Facilitating farmers' access to the necessary financing to encourage production	66.6	25.0	8.4	2.58	2
	Expanding the scope of financial services for farmers by adopting modern technologies	58.3	30.0	11.7	2.46	3
	Sub-average				2.58	
Water Resources Management and Irrigation Systems	Setting specifications for agricultural commodities and products permitted for local and international trade	60.0	31.6	8.4	2.52	1
	Selecting crops that are effective in meeting agricultural food needs	63.3	21.7	15.0	2.48	2
	Developing a strategy to achieve a balance between local production and investment	58.5	28.3	13.2	2.45	3
	Monitoring markets to regulate food handlers' practices	40.0	36.6	23.4	2.33	4
	Sub-average				2.44	
Financing, Investment, and Pricing Policies	Distributing production fairly among consumers	60.0	31.6	8.4	2.52	1
	Orienting resources among different types of production	65.0	20.0	15.0	2.50	2
	Allocating investments to non-agricultural sectors at the expense of the agricultural sector	61.7	21.7	16.6	2.45	3
	Supporting and developing the agricultural sector	53.4	23.3	23.3	2.33	4
	Sub-average				2.45	
Food Quality and Safety Improvement Policies	Developing municipal cadres to manage water resources efficiently	78.3	10.0	11.7	3.00	1
	Improving the use of rainwater for agricultural purposes	65.0	21.7	13.3	2.52	2
	Controlling chemicals to prevent watershed pollution	60.0	31.6	8.4	2.52	2 (duplicate)
	Reducing the production of water-	40.0	36.6	24.4	2.33	3

Policy Focus	Policy	High (%)	Medium (%)	Poor (%)	Weighted Average	Ranking
	intensive crops					
	Sub-average				2.59	
	Overall average				2.29	

Distribution of the roles of various agencies in implementing food security policies

Table 3 illustrates the distribution of roles of various actors in implementing food security policies. The Ministry of Agriculture plays a pivotal role in most of these policies, particularly in the areas of improving food quality and managing water resources. Private institutions, cooperatives, civil society, and voluntary organizations also contribute to varying degrees to supporting and implementing these policies, reflecting the necessary coordination and integration between the formal and informal sectors to ensure sustainable food security.

Responsibility for implementing food security policies is distributed among central government agencies and regulatory bodies, municipalities and agricultural departments, the private sector, non-governmental organizations, funding agencies, universities, and research centers. This contributes to the integration of efforts and the development of effective mechanisms to enhance food security and sustainability.

Table (3): Agencies responsible for implementing policies related to food security

Axis and Policy		Cooperative Institutions	Private Institutions	Voluntary Agencies	Ministry of Agriculture	Civil Society
Social Security Policies	Improving food security and reducing dependence on imports	16.60%	26.60%	6.60%	30.00%	20.20%
	Expanding financial services using technology	13.30%	23.30%	13.30%	40.00%	10.10%
	Facilitating farmers' financing	3.30%	13.30%	26.60%	33.30%	23.50%
Food Quality and Safety Policies	Selecting strategic crops for food security	26.60%	6.60%	16.60%	43.30%	6.90%
	Monitoring food markets	23.30%	3.40%	20.90%	50.50%	1.90%
	Defining food product specifications	6.60%	23.30%	13.30%	33.30%	23.50%
	Preparing a food security strategy	20.00%	10.00%	10.00%	40.00%	20.00%
Financing, Investment, and Pricing Policies	Supporting and developing the agricultural sector	3.40%	16.60%	23.30%	46.70%	10.00%
	Focusing investments on non-agricultural sectors	16.60%	26.70%	10.00%	43.90%	2.80%
	Directing resources among production sectors	20.00%	6.60%	6.60%	53.60%	13.20%
	Equitable distribution of food production	10.00%	6.60%	10.00%	56.60%	16.80%
	Training local cadres for agricultural water management	13.40%	30.00%	6.60%	40.00%	10.00%
	Improving the utilization of	16.60%	13.40%	23.30%	46.70%	-

Axis and Policy		Cooperative Institutions	Private Institutions	Voluntary Agencies	Ministry of Agriculture	Civil Society
Water Management and Irrigation	rainwater					
	Controlling chemicals to prevent water pollution	6.70%	10.00%	20.00%	53.30%	10.00%
	Reducing the production of water-intensive crops	10.00%	26.60%	13.80%	46.90%	2.70%

Contribution of Agricultural Extension and State Institutions to Achieving Food Security Policies

Table 4 illustrates the disparity in the level of contribution of agricultural extension and state institutions to implementing policies to achieve food security and facilitate financing for farmers. State institutions are more supportive of these policies than agricultural extension, indicating a pivotal role for official institutions in adopting more effective strategies in this area, while agricultural extension still needs to strengthen its role in achieving these strategic objectives.

Table (4): Contribution of Agricultural Extension and Institutions to Food Security and Financing Policies

Policies	Contribution of Agricultural Extension	Average Extension	Rank	Contribution of State Institutions	Average Institutions	Rank
Improving food security and reducing dependence on imports	High : %45.0 Medium : %23.3 Weak : % 31.7	2.13	2	High : %70.0 Medium : %26.6 Weak : % 3.4	2.7	1
Expanding financial services using technology	High : %41.7 Medium : %21.6 Weak : %36.7	2.10	3	High : %61.7 Medium : %25.0 Weak : % 13.3	2.5	3
Facilitating financing for farmers	High : %36.7 Medium : %30.0 Weak : %33.3	2.20	1	High : % 66.7 Medium : %20.0 Weak : %13.3	2.53	2
Average	–	2.14	–	–	2.58	–

Table 5 illustrates the contrasting roles of agricultural extension and state institutions in supporting policies related to food quality and safety. State institutions demonstrated more effective performance in most policies, particularly in developing general strategies. Meanwhile, agricultural extension's contribution was less significant, indicating the need to strengthen its technical and awareness-raising role in this vital area.

Table (5): Contribution of Agricultural Extension and State Institutions to Food Quality and Safety Policies

Policies	Contribution of Agricultural Extension	Average Extension	Rank	Contribution of State Institutions	Average Institutions	Rank
Selecting strategic crops for food security	%45.0 / High %21.6 / Medium %33.4 / Weak	2.10	1	%68.3 / High %28.3 / Medium %3.4 / Weak	2.5	3
Setting	%40.0 / High	2.00	2	%58.3 / High	2.6	2

Policies	Contribution of Agricultural Extension	Average Extension	Rank	Contribution of State Institutions	Average Institutions	Rank
specifications for agricultural commodities	%16.6 / Medium %43.4 / Weak			%30.3 / Medium %11.4 Weak /		
Market monitoring	%46.6 / High %20.0 / Medium %33.4 / Weak	2.10	1	%53.3 / High %36.7 / Medium %10.0 / Weak	2.4	4
Developing a strategy that balances production and investment	%38.3 / High %25.0 / Medium %36.7 / Weak	2.00	2 (duplicate)	%80.0 / High %13.3 / Medium %6.7 / Weak	2.7	1
Average	–	2.05	–	–	2.55	–

Table 6 shows a clear disparity in the level of contribution of agricultural extension and state institutions to supporting financing and investment policies. State institutions emerged as the most effective, particularly in supporting and developing the agricultural sector. In contrast, the contribution of agricultural extension was modest, calling for strengthening its role in directing resources and achieving equitable distribution that serves the development of the agricultural sector in a more integrated manner.

Table (6): Contribution of Agricultural Extension and State Institutions to Financing and Investment Policies in the Agricultural Sector

Policies	Contribution of Agricultural Extension	Average Extension	Rank	Contribution of State Institutions	Average Institutions	Rank
Supporting and developing the agricultural sector	%31.6 / High %38.3 / Medium %30.1 / Weak	1.7	4	%70.0 / High %25.0 / Medium %5.0 / Weak	2.7	1
Focusing on non-agricultural sectors	%30.0 / High %45.0 / Medium %25.0 / Weak	2.1	1	%55.0 / High %30.0 / Medium %15.0 / Weak	2.4	3
Directing resources between production	%35.0 / High %26.6 / Medium %38.4 / Weak	2.0	2	%61.7 / High %26.6 / Medium %11.7 / Weak	2.5	2
Equitable distribution of production	%33.3 / High %25.0 / Medium %41.7 / Weak	1.9	3	%53.3 / High %35.0 / Medium %11.7 / Weak	2.4	3 (duplicate)
Average	–	1.93	–	–	2.5	–

Table 7 illustrates the role of agricultural extension and state institutions in supporting water management policies and promoting agricultural sustainability. The data show a relative superiority of state institutions, particularly in improving rainwater use and chemical control, reflecting greater institutional commitment in this area. At the same time, the contribution of agricultural extension remains modest and requires further activation to achieve effective integration in natural resource management. The results indicate that state institutions recorded a higher overall average contribution (2.53) compared to agricultural extension (2.07), indicating a greater role for formal institutions in implementing agricultural policies and highlighting the need to enhance the effectiveness of agricultural extension in this context.

Table (7): Contribution of Agricultural Extension and State Institutions to Water Resources Management and Sustainable Agriculture Policies

Policies	Contribution of Agricultural Extension	Average Extension	Rank	Contribution of State Institutions	Average Institutions	Rank
Qualifying cadres for water resource management	%31.6 / High %53.4 / Medium %15.0 / Weak	2.2	2	%53.4 / High %21.6 / Medium %25.0 / Weak	2.3	4
Utilizing rainwater	%40.0 / High %43.3 / Medium %16.7 / Weak	2.2	2 duplicates	%76.6 / High %16.7 / Medium %6.7 / Weak	2.7	1
Controlling agricultural chemicals	%43.3 / High %30.3 / Medium %26.4 / Weak	2.1	3	%68.3 / High %21.7 / Medium %10.0 / Weak	2.6	2
Reducing water-intensive crops	%38.3 / High %55.0 / Medium %6.7 / Weak	2.3	1	%58.3 / High %20.0 / Medium %21.7 / Weak	2.4	3
Average	–	2.2	–	–	2.5	–

Key Challenges Facing Food Security Policies

Table 8 illustrates the most significant challenges facing food security policies across four main axes: social policies, food quality and safety policies, financing and investment policies, and water management policies. These challenges are categorized into five main areas: legislation, financing, guidance and regulation, production inputs, and access to information. The table shows significant variation in the degree of challenge across these areas, highlighting the need for integrated interventions to address imbalances and achieve sustainable food security. The results show that the most significant challenges facing food policies are the availability of production inputs (43.2%), followed by legislation (16.0%), and financing (14.2%). The least significant challenges were related to guidance and regulation (13.7%) and access to information (12.3%). This highlights the need to address production constraints and develop government and financing frameworks to support policy effectiveness.

The main reason why climate change is often not considered a major challenge is the focus on more pressing issues such as direct financing or water management, as well as the lack of data in this study.

Table 8: Key Challenges Facing Food Security Policies by Axis

Axis	Policies	Legislation	Financing	Guidance and Regulation	Production Requirements	Access to Information
Social Security Policies	Improving food security and reducing dependence on imports	26.60%	6.60%	16.60%	43.30%	6.90%
	Expanding financial services using modern technologies	23.30%	3.30%	20.00%	50.50%	2.90%
	Facilitating financing for farmers	6.60%	23.30%	13.30%	33.30%	23.50%
	Average	18.80%	11.30%	16.60%	42.40%	10.90%
Food Quality and Safety	Strategic Crop Selection	23.30%	3.30%	20.20%	50.50%	2.70%

Axis	Policies	Legislation	Financing	Guidance and Regulation	Production Requirements	Access to Information
Policies	Commodity and Product Specifications	6.60%	23.30%	13.30%	33.30%	23.50%
	Market Control	20.00%	10.00%	10.00%	40.00%	20.00%
	Production and Investment Balance Strategy	16.60%	26.60%	6.60%	30.00%	20.20%
	Average	16.90%	15.80%	12.50%	38.50%	16.30%
Financing and Investment Policies	Supporting and developing the agricultural sector	3.40%	16.60%	23.30%	46.70%	10.00%
	Weak investment in the agricultural sector	16.60%	26.70%	10.00%	43.30%	2.40%
	Allocating resources among production types	20.00%	6.60%	6.60%	53.30%	13.50%
	Equitable distribution of production	10.00%	6.60%	10.00%	56.60%	16.80%
	Average	12.50%	14.10%	12.50%	50.00%	10.90%
Water Management and Irrigation System Rehabilitation	Qualifying local cadres to manage water resources	23.30%	3.30%	20.00%	50.50%	2.90%
	Utilizing rainwater	6.60%	23.30%	13.30%	33.30%	23.50%
	Controlling agricultural chemicals	20.00%	10.00%	10.00%	40.00%	20.00%
	Reducing water-intensive crops	16.60%	26.70%	10.00%	43.30%	3.40%
	Average	16.90%	15.80%	13.70%	41.80%	11.80%

Table 9 illustrates the varying levels of achievement of the proposed food security policy mechanisms, with challenges related to infrastructure, trade liberalization, and water resource management. The findings reveal relative weaknesses in some areas, such as projects and food processing, indicating the need to strengthen management, institutional support, and financing to achieve sustainable food security goals.

Table 9: Mechanisms for Level of Achieving Food Security Policies and Addressing Institutional and Structural Challenges

Proposed mechanism for achieving food security policy	High (%)	Medium (%)	Weak (%)	Weighted average
Adequate processing and storage infrastructure	36.6	13.3	26.6	5.8
Reducing customs duties and opening markets	31.6	15.0	28.3	5.8
Increasing water supplies through rehabilitating the irrigation system	28.3	23.3	36.6	5.8
Production policy and cropping structures	36.6	15.0	20.0	5.6
Understanding consumer and producer responses to price changes	13.3	20.0	23.3	5.6
Supporting research and development to increase food content	36.6	36.6	33.3	4.8
Developing nutritional component indicators	21.6	25.0	26.6	5.0
Controlling chemicals and preventing water pollution	8.3	41.6	21.6	4.3

Proposed mechanism for achieving food security policy	High (%)	Medium (%)	Weak (%)	Weighted average
Incentivizing savings to finance agricultural activities	23.3	21.6	8.0	4.3
Equitable income distribution and its impact on consumption and investment	20.0	23.3	38.3	4.4
Reducing food loss and linking farmers to markets	20.0	53.3	25.0	4.4
Establishing farmer associations to support development projects	35.0	23.3	30.0	7.1
Improving institutional capacity to address food prices	18.3	20.0	31.6	8.5
Expanding agricultural and food processing	20.0	25.0	25.0	4.1
Establishing a coordinated agricultural development system	13.3	26.6	16.6	3.8
Establishing civil society organizations for food distribution	15.0	28.3	23.3	3.3
Clarity in food security policy objectives	25.0	16.6	25.0	4.2

Table 10 indicates that natural challenges have the greatest impact on food security policies, followed by political challenges, then social and economic challenges, requiring institutional coordination and comprehensive strategies to address these factors effectively.

Grouping these challenges into one paragraph highlights their overall picture and facilitates understanding of their combined impact on food security, reinforcing the importance of treating them as an interconnected unit when formulating analysis and policies.

Table 10: Priority of Natural Challenges in Formulating Food Security Policies

Challenge Type	Challenges	High (%)	Medium (%)	Weak (%)	Weighted Average
Social and Economic Challenges	Population growth	36.6	48.3	25.0	2.3
	Lack of financing for agricultural production	30.0	38.3	21.6	1.9
	Facilitated access to agricultural loans	41.6	33.3	25.0	2.2
	Unstable food prices	32.3	46.6	6.6	2.4
	Rural-to-urban migration	46.6	25.0	21.6	1.8
	High costs of agricultural inputs	46.6	33.3	25.0	2.1
	Average				2.12
Political Challenges	Difficulty accessing food commodities due to rising global prices	53.3	26.6	26.6	2.2
	Lack of national programs facilitating farmers' access to financing	41.6	20.0	35.0	2.2
	Weak support from agricultural training institutions	45.0	20.0	25.0	2.3
	Average				2.23
Natural Challenges	Climate change	55.0	45.0	6.6	2.4
	Soil and water problems	45.0	20.0	26.6	2.3
	Introducing new breeds	53.3	41.6	25.0	2.3
	Diversifying water supply sources to achieve long-term water security	33.3	36.6	11.6	2.4
	Preserving non-renewable water resources for future generations	51.6	36.6	16.6	2.3
	Average				2.34

Institutional Constraints on Food Security Policies

Table 11 highlights the significant links between agricultural extension policies and constraints to food security policy implementation, indicating the impact of extension in mitigating these challenges. The most significant links appear in the areas of "access to information" and "production requirements," reflecting the need to strengthen extension capacities to transfer knowledge and facilitate production requirements to support the effectiveness of various policies.

Table 11: Correlations between Agricultural Extension and Food Security Policy Requirements

Informed Guidance Policy	Food Security Barriers				
	Legislation (%)	Financing (%)	Guidance and Regulation (%)	Production Requirements (%)	Access to Information (%)
Social Security Policies	0.221*	0.273*	0.321*	0.255*	0.333**
Policies to Improve Food Quality and Safety	0.226*	0.285*	0.261*	0.241*	0.245*
Financing, Investment, and Pricing Policies	0.223*	0.272*	0.242*	0.322*	0.265*
Integrated Water Management Policies and Rehabilitation of Existing Irrigation Systems	0.312*	0.260*	0.232*	0.344**	0.231*

The mark (**), (*) indicates a significant association at a statistical significance level ($P < 0.01$), ($P < 0.05$), respectively.

Discussion

Table 1 shows a clear disparity between agricultural extension workers and administrators in terms of age, academic qualifications, and years of experience. Specifically, older, more experienced individuals predominate in administrative positions. For instance, administrators over the age of 41 accounted for 50.0%, compared to 40.0% of extension workers. Moreover, 86.6% of administrators had over 13 years of experience, compared to only 40.1% of extension workers. In addition, in terms of academic qualifications, university degrees predominated among extension workers, representing 56.7% of the sample, whereas 53.3% of administrators held intermediate qualifications, reflecting the disparity in educational and career paths between the two groups. On the training side, there is a clear interest in strategic topics, with 36.6% of extension workers and 40.0% of administrators participating in courses related to water conservation, and additionally, 33.4% of extension workers and 30.0% of administrators participating in courses related to food safety and hygiene. However, there was less interest in training courses such as food waste reduction (10.0% and 16.6%, respectively). Consequently, this disparity suggests a need to redesign training programs to be more comprehensive and balanced, which would contribute to enhancing the efficiency of both groups. Overall, these differences highlight the importance of designing human development policies that take into account the specificities of each group, thereby enhancing the effectiveness of agricultural extension and administrative performance in the agricultural sector. These results were supported by Gurning et al., (2023).

Table 2 illustrates the varying levels of participants' knowledge of food security policies in Jordan. The Water Resources and Irrigation Systems Management axis showed the highest average knowledge, at 2.59. The "Formation of Municipal Cadres to Efficiently Manage Water Resources" policy ranked first, with a high knowledge rate of 78.3%, reflecting advanced awareness of the importance of water management in sustainable agriculture. The Social Security Policy, with an average of 2.58, followed this. The "Improving Food Security and Reducing Dependence on Imports" policy received a high rating from 75.0% of participants, followed by Farmer Financing Policies, which received a rating of 66.6%. In contrast, some policies showed relatively weak knowledge levels, particularly the "Market Control" policy within the Food Quality and Safety axis, with only 40.0%, and the "Reducing Production of Water-Intensive Crops" policy. The financing and investment policies axis also achieved an average score of 2.45, with success rates for policies such as "Resource Orientation" (65.0%) and "Fair Distribution of Production" (60.0%), compared to relatively low success rates for

"Agricultural Sector Support and Development" (53.4%). These differences highlight the need to plan capacity-building programs that target the weakest areas of knowledge to ensure a comprehensive and integrated understanding of food security policies and their effective implementation on the ground. These were agreed by Nguyen-Viet et al., (2018).

Table 3 illustrates the distribution of responsibilities among various entities in implementing food security policies in Jordan. The Ministry of Agriculture assumes the majority of roles across various axes, bearing a significant share of responsibility for policies such as "equitable distribution of production" (56.6%), "directing resources between production sectors" (53.3%), and "setting food product specifications" (50.5%). It also plays a prominent role in "improving the use of rainwater" (46.7%) and "supporting and developing the agricultural sector" (46.7%). In contrast, private institutions play a relatively strong role in axes such as "reducing the production of water-intensive crops" (26.6%) and "monitoring food markets" (23.3%). Voluntary organizations and civil society play relatively smaller roles, with significant involvement in policies such as "facilitating financing for farmers" (26.6%), civil society (23.3%), and "controlling chemicals to prevent water pollution" (20.0%). These distributions reflect the diversity of partnerships among actors, emphasizing the pivotal role of the Ministry of Agriculture in leading and coordinating food security efforts with various institutions to enhance implementation effectiveness. These were concurred with Miruka et al., (2012) and Smyth et al., (2021).

Table 4 illustrates the contribution of agricultural extension and state institutions to supporting food security and financing policies, with varying levels of engagement between the two parties. State institutions recorded the highest average contribution of 2.58, ahead of agricultural extension, which recorded an average of 2.14. Regarding specific policies, the "Facilitating Financing for Farmers" program ranked first in terms of agricultural extension contribution, with an average of 2.20, representing a high percentage of 36.7%. Meanwhile, the "Improving Food Security and Reducing Import Dependence" program recorded the highest contribution from state institutions, representing 70.0%, with an average of 2.7%. Despite the variance in the indicators mentioned in Table (4), agricultural guidance remains a pivotal element in supporting agricultural financing policies, with an urgent need to enhance institutional cooperation and capacity building to ensure the implementation of food security policies in Jordan in a more integrated and effective manner. These coincided with El-Zubi & Shuaibi, (2021).

Table 5 illustrates the contribution of agricultural extension and state institutions to the implementation of food quality and safety policies. State institutions recorded a higher average contribution (2.55) compared to agricultural extension (2.05). At the sub-policy level, the "Developing a Strategy to Balance Production and Investment" policy emerged as the highest contribution of state institutions, with 80.0% of high and medium ratings (2.7), while agricultural extension recorded the highest contribution of the "Market Control" and "Strategic Crop Selection" policies, with 46.6% and 45.0%, respectively, with an average of 2.10. However, some policies, such as the "Setting Agricultural Commodity Specifications" policy, showed a relatively weak contribution of agricultural extension (43.3%), indicating the need to strengthen its role in this aspect. These results reflect the importance of coordination between agricultural extension and state institutions to enhance food quality and safety in Jordan, with a focus on supporting extension to enhance its contribution to all relevant policies. These complied with Tarawneh et al., (2022) and Mohammad et al., 2024).

Table 6 illustrates the contribution of agricultural extension and state institutions to supporting financing and investment policies in the agricultural sector. State institutions recorded a higher average contribution of 2.5, outperforming agricultural extension, which recorded an average contribution of 1.93. In policy detail, state institutions ranked first in supporting and developing the agricultural sector, with a high contribution of 70.0%, compared to only 31.6% for

agricultural extension. Agricultural extension also showed varying contributions to other policies, such as "focus on non-agricultural sectors" and "directing resources between productions," with high contributions of 30.0% and 35.0%, respectively. Agricultural extension also recorded high percentages of medium and weak contributions, indicating its limited actual role in these policies. These results reflect the importance of strengthening the role of agricultural extension and developing its capacities to be an effective partner alongside state institutions in achieving investment and financing development for the agricultural sector. These conformed with Antwi-Agyei & Stringer, (2020) and Osumba et al., (2020).

Table 7 illustrates the levels of contribution of agricultural extension and state institutions to water resources management and sustainable agriculture policies. State institutions outperform, with an average contribution of 2.5, compared to the average contribution of agricultural extension (2.2). State institutions played a prominent role in the "Rainwater Harvesting" policy, with a high contribution of 76.6%, followed by the "Control of Agricultural Chemicals" policy (68.3%), and then "Reducing Water-Intensive Crops" policy (58.3%). In contrast, the contribution of agricultural extension was relatively strong in policies such as "Reducing Water-Intensive Crops", with a high contribution of 38.3%, and "Control of Chemicals" (43.3%), but remained limited in the "Rainwater Harvesting" policy, with a contribution of no more than 4.0%. The contribution of agricultural extension was also concentrated at the intermediate level in most policies, reflecting its awareness-raising and technical role, but it requires greater institutional empowerment to keep pace with the level of contribution of official bodies. These results confirm the need for integrated roles between agricultural extension and state institutions to enhance the efficiency of water resources management and achieve the goals of sustainable agriculture in Jordan. These match the findings of Bdour et al., (2022), and Ghanayem et al., (2025).

Table 8 indicates that the main challenges facing food security policies in Jordan vary across the various pillars. However, "production requirements" is considered the most influential constraint across most policies, with particularly high averages for financing policies (50.0%) and social policies (42.4%), reflecting the importance of developing supply chains and logistics support. "Legislation" and "financing" pose significant challenges, particularly in water management and food quality and safety policies, where they appear at varying rates, reaching 26.7% in some policies. In contrast, "access to information" appears to be a relatively minor challenge, except for a few individual policies such as "commodity specifications" and "rainwater utilization." These findings reflect the need for a comprehensive approach that addresses weak infrastructure, legislation, and financing, while enhancing the role of agricultural extension in transferring knowledge and providing information to support policy effectiveness and achieve sustainable food security goals. This was agreeable with the findings of Wiedermann et al., (2022).

Table (9) shows a significant discrepancy in the estimates of the levels of implementation of the proposed mechanisms to support food security policies, with the "Improving institutional capacity to address food prices" mechanism recording the highest weighted average (8.5) compared to the other mechanisms, Followed by the mechanism "establishing farmers' associations to support development projects" (7.1). Mechanisms such as "establishing civil society organizations to distribute food" and "establishing a coordinated agricultural development system" recorded the lowest estimates (3.3 and 3.8, respectively). It also highlights the importance of infrastructure, food processing, chemical control, and savings incentives as factors that influence, to varying degrees, policy achievement, reflecting the diversity of mechanisms and the variance in their effectiveness in supporting food security. These correspond to the findings of Zeng et al., (2025); Mahmood et al., (2024).

Table 10 shows that food security policies face a range of challenges, classified as social, economic, political, and natural. Weighted average data indicate that natural challenges are the

most influential (2.34), followed by political challenges (2.20), and then social and economic challenges (2.10). Prominent among these challenges are climate change, food price volatility, and difficulty accessing basic commodities due to rising global prices. In addition, rural-urban migration, weak agricultural financing, and the absence of support programs limit the effectiveness of policies. These findings suggest the need to adopt an integrated approach to address these challenges and achieve sustainable food security. This was agreeable with the findings of Raidimi & Kabiti, (2019).

Table 11 shows significant correlations between agricultural extension and food security policy requirements. These correlations are clearly evident in constraints such as "access to information," "production requirements," and "legislation," highlighting the importance of developing informational, legislative, and institutional frameworks to support the effectiveness of these policies. For example, agricultural extension and social security policies were strongly and significantly associated with access to information (**0.333), and to a lesser extent with financing and legislation. On the other hand, integrated water management policies showed a strong association with production requirements (**0.344), emphasizing the need to integrate agricultural extension with institutional support tools to overcome constraints and enhance the effectiveness of food policies. These results were supported by Mapiye et al., (2020) and Maake & Antwi, (2022).

An Outlook for Agricultural Extension Policies in Jordan

In light of the study's findings, there is an urgent need to restructure agricultural extension policies in Jordan within a comprehensive vision that enhances its integration with state institutions and activates its role in achieving food security goals. The gap between extension and administrative cadres in terms of age, qualifications, and experience (Habibullah et al., 2024), along with the disparity in policy knowledge and contributions between extension and state institutions (Flood and Wilson, 2025), highlights the importance of adopting professional qualification and development policies based on continuous empowerment strategies and precise specialization.

The future of agricultural extension requires a focus on building knowledge capacity in less understood policies, such as market regulation and food quality (Antwi-Agyei & Stringer, 2020), and expanding training to include emerging topics such as climate change adaptation, digital transformation, and smart agriculture technologies. Awareness and the technical role of extension in areas such as water management and resource-intensive crop reduction (Chidimbah Munthali, et al., 2025) should also be enhanced by equipping extension with technological and institutional tools that enhance field efficiency. Similarly, coordination between extension and various stakeholders, including ministries, private institutions, and civil society, must be built on a participatory basis, combining technical knowledge and community expertise for more effective policy implementation (Prajapati et al., 2025). This requires restructuring work mechanisms, clearer allocation of responsibilities, and sustainable funding sources for agricultural extension, especially in light of current financial and legislative challenges (Maulu et al., 2021). The future of agricultural extension services in Jordan depends on their ability to transform from a traditional role to a true development partner, contributing to policy formulation and implementation, and addressing institutional and information gaps to ensure sustainable and comprehensive food security (Maulu et al., 2021).

Agricultural extension in Jordan contributes to supporting food security policies by enhancing the efficiency of extension personnel, identifying information providers, and strengthening the link between extension programs and policy objectives, while addressing knowledge and institutional gaps. This requires developing specialized qualification programs and expanding training to include topics such as climate change adaptation, digital transformation, and smart agriculture. It also requires enhancing collaborative coordination between extension, government and private entities, and civil society, and providing technological tools and clear

working mechanisms. This enables extension to play an effective role as a partner in development and achieving sustainable food security.

Conclusions

The results reveal a disparity in the capabilities of agricultural extension workers and administrators, requiring comprehensive development policies and intensive training. The Ministry of Agriculture plays a pivotal role in achieving food security, and coordination with cooperative institutions, civil society, and the private sector must be strengthened. Agricultural extension suffers from weak technical contributions, requiring enhanced collaboration. Policies face production, legislative, financial, and infrastructural challenges, in addition to challenges related to climate change, water, and soil, requiring integrated environmental and regulatory strategies. Agricultural extension represents a pivotal tool in supporting food security policies in Jordan by enhancing the knowledge of extension workers, identifying the responsible parties for providing information, and enhancing the relevance of extension programs to policy objectives. This underscores the need to develop the extension structure and its institutional and professional capacities to ensure its effective contribution to achieving sustainable food security.

References

- Abo Znemah, S., Tarawneh R., Shnaigat S., Al-Najjar K. (2023). Estimating Some Indicators of Food Security for Rural Households. *Asian Journal of Agriculture and Food Sciences*. Vol. 11, Issue 1. <https://doi.org/10.24203/ajafs.v11i2.7171>
- Abu harb, S., Dayoub, M. and Al-Najjar, K. (2024b). The impact of agricultural extension program effectiveness on sustainable farming: A survey article. *International Journal of Agricultural Technology* 20(2):477-492. <http://www.ijat-aatsea.com/>
- Abu harb, S., Tarawneh R.A., Abu Hantash K.L.A., Altarawneh M., and Al-Najjar K. (2024a). Empowering Rural Youth Through Sustainable Innovation, Entrepreneurship, And Peer Learning In Agriculture. Vol: 61, Issue: 11. *Hunan Daxue Xuebao/Journal of Hunan University Natural Sciences*. <https://doi.org/10.5281/zenodo.14058869>
- Al-Lataifeh, F., Tarawneh R., Al-Taha'at E., Dayoub M., Sutinen E., & Al-Najjar K. (2024). Smart Technologies for Livestock Sustainability and Overcoming Challenges: A Review. *Xi'an Shiyou Daxue Xuebao (Ziran Kexue Ban)/ Journal of Xi'an Shiyou University, Natural Sciences Edition*. (67, 09, 196-204). Zenodo. <https://doi.org/10.5281/zenodo.13744058>
- Anber A. S. M., Mohammad, S., Al- Daoud, K. I., Oraini, B. A., Vasudevan, A., & Feng, Z. (2025). Building Resilience in Jordan's Agriculture: Harnessing Climate Smart Practices and Predictive Models to Combat Climatic Variability. *Research on World Agricultural Economy*, 6(2), 171–191. <https://doi.org/10.36956/rwae.v6i2.1628>
- Antwi-Agyei, P., & Stringer, L. C. (2020). Improving the effectiveness of agricultural extension services in supporting farmers to adapt to climate change: Insights from northeastern Ghana. *Climate Risk Management*, 32, 100304. <https://doi.org/10.1016/j.crm.2021.100304>
- Baig, M.B., Straquadine, G.S., Qureshi, A.M., Hajiyevev, A., Abou Hadid, A.F. (2019). Sustainable Agriculture and Food Security in Egypt: Implications for Innovations in Agricultural Extension. In: Behnassi, M., Pollmann, O., Gupta, H. (eds) *Climate Change, Food Security and Natural Resource Management*. Springer, Cham. https://doi.org/10.1007/978-3-319-97091-2_5
- Bdour, M., Alnaief, M., Rabaiah, S., & Schweimanns, N. (2022). Water Resources in Jordan: A Review of Current Challenges and Future Opportunities. *Water*, 15(21), 3729. <https://doi.org/10.3390/w15213729>

-
- Chidimbah Munthali, G. N., Puming, H., Banda, L. O., & Ngulube, P. S. (2025). Diversities of conservation agriculture technologies being adopted by rural farmers in sub-Saharan Africa region: A case study from Vibangalala extension planning area, Mzimba District, Malawi. *Frontiers in Sustainable Food Systems*, 9, 1529846. <https://doi.org/10.3389/fsufs.2025.1529846>
- Dayoub, M., Shnaigat, S., Tarawneh, R.A., Al-Yacoub, A.N., Al-Barakeh, F., Al-Najjar, K. (2023). Applications of Smart Agriculture to Improve Animal Production: Opportunities, Challenges, Solutions, and Benefits. Preprints, 2023101229. <https://www.preprints.org/manuscript/202310.1229/v1>
- Dayoub, M., Shnaigat S., Tarawneh R.A., Al-Yacoub A.N., Al-Barakeh F., Al-Najjar K. (2024). Enhancing Animal Production through Smart Agriculture: Possibilities, Hurdles, Resolutions, and Advantages. *Ruminants*. 4(1): 22-46. <https://doi.org/10.3390/ruminants4010003>
- Dhehibi, B., Kassam, S. N., Aw-Hassan, A., & Al-Rusheidat, J. (2017). Enhancing agricultural extension services for rural development in Jordan. *International Journal of Agricultural Extension*. 05 (02) 2017. 51-60. <http://www.escijournals.net/IJAE>
- El-Dukheri, I., Amer, K.M. (2024). Role of the Arab Organization for Agricultural Development in Promoting Agricultural Development and Food Security in the Arab Region. In: Ahmed, A.E., Al-Khayri, J.M., Elbushra, A.A. (eds) *Food and Nutrition Security in the Kingdom of Saudi Arabia*, Vol. 1. Springer, Cham. https://doi.org/10.1007/978-3-031-46716-5_2
- El-Zubi, F., & Shuaibi, E. (2021). Jordan's Role in A Regional Food Hub. *Jordan Journal of Agricultural Sciences*, 17(3), 171–185. <https://doi.org/10.35516/jjas.v17i3.77>
- Flood, K., & Wilson, D. (2025). Evidence Synthesis and Knowledge Integration for Sustainable Peatland Management. *Land*, 14(7), 1397. <https://doi.org/10.3390/land14071397>
- Ghanayem, A. A., Mohd Nor, R., & A Al-Assaf, A. (2025). Formulating Strategies for Improving Food Security among Smallholder Farmers in the Middle Jordan Valley (Ghawr). *Research on World Agricultural Economy*, 6(3), 706–725. <https://doi.org/10.36956/rwae.v6i3.1950>
- Ghanayem, A., & Mohd Nor, R. (2025). Reviewing Agricultural Challenges and Solutions for Empowering Smallholders in the Middle East. *Research on World Agricultural Economy*, 6(3), 684–705. <https://doi.org/10.36956/rwae.v6i3.1688>
- Gurning, R. N. S., Puarada, S. H., Lubis, W., & Nurhajjah, N. (2023). Performance of Agricultural Extension Services (BPP) in Enhancing Rice Production in North Sumatra, Indonesia. *Agriecobis: Journal of Agricultural Socioeconomics and Business*, 6(02), 149–157. <https://doi.org/10.22219/agriecobis.v6i02.28812>
- Habibullah Magsi, Muhammad Hamid Nawaz Khan, Zaheeruddin Mirani, Muhammad Ismail Kumbhar, Aijaz Ali Khooharo, Fateh Muhammad Mari, Syed Taimoor shah. (2024). Relationship between Demographic Factors, In-Service Training, and Professional Competencies in Agricultural Extension. *Social Science Review Archives*, 2(2), 2264–2283. <https://doi.org/10.70670/sra.v2i2.452>
- Idris, Iffat (2016). Economic Situation in Jordan. The Institute of Development Studies and Partner Organisations. Report. <https://hdl.handle.net/20.500.12413/13045>
- Khalaf, A. G., & Al-Mashhadani, A. L. J. (2023). Requirements for Using Digital Agricultural Extension in Providing Extension Service from Viewpoint of Agricultural Extension Agents. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1259, No. 1, p. 012134). IOP Publishing. <https://doi.org/10.1088/1755-1315/1259/1/012134>

-
- Maake, M.M.S., Antwi, M.A. (2022). Farmer's perceptions of effectiveness of public agricultural extension services in South Africa: an exploratory analysis of associated factors. *Agric & Food Secur* 11, 34. <https://doi.org/10.1186/s40066-022-00372-7>
- Mahmood, S., Misra, P., Sun, H. et al. (2024). Sustainable infrastructure, energy projects, and economic growth: mediating role of sustainable supply chain management. *Ann Oper Res*. <https://doi.org/10.1007/s10479-023-05777-6>
- Mapiye, O., Makombe, G., Molotsi, A., Dzama, K., & Mapiye, C. (2020). Towards a Revolutionized Agricultural Extension System for the Sustainability of Smallholder Livestock Production in Developing Countries: The Potential Role of ICTs. *Sustainability*, 13(11), 5868. <https://doi.org/10.3390/su13115868>
- Maulu, S., Hasimuna, O. J., Mutale, B., Mphande, J., & Siankwilimba, E. (2021). Enhancing the role of rural agricultural extension programs in poverty alleviation: A review. *Cogent Food & Agriculture*, 7(1). <https://doi.org/10.1080/23311932.2021.1886663>
- Miruka, M.K., Okello, J.J., Kirigua, V.O. et al. (2012). The role of the Kenya Agricultural Research Institute (KARI) in the attainment of household food security in Kenya: A policy and organizational review. *Food Sec.* 4, 341–354. <https://doi.org/10.1007/s12571-012-0197-9>
- Mohammad, A. A. S., Suleiman Ibrahim Shelash Mohammad, Al- Daoud , K. I., Oraini, B. A., Vasudevan, A., & Feng, Z. (2024). Optimizing the Value Chain for Perishable Agricultural Commodities: A Strategic Approach for Jordan. *Research on World Agricultural Economy*, 6(1), 465–478. <https://doi.org/10.36956/rwae.v6i1.1571>
- Nguyen-Viet, H., Grace, D., Pham-Duc, P., Dang-Xuan, S., Luu-Quoc, T., Unger, F., De Vlieger, S., Pham-Thi, N., Duong-Van, N., Nguyen-Hung, L., Tran-Dinh, L., & Tuyet-Hanh, T. T. (2018). Research and training partnership to assist policy and capacity building in improving food safety in Vietnam. *Global Food Security*, 19, 24-30. <https://doi.org/10.1016/j.gfs.2018.08.009>
- Osumba, J. J., Recha, J. W., & Oroma, G. W. (2020). Transforming Agricultural Extension Service Delivery through Innovative Bottom-Up Climate-Resilient Agribusiness Farmer Field Schools. *Sustainability*, 13(7), 3938. <https://doi.org/10.3390/su13073938>
- Prajapati, Chandra Shekhar, N Krishna Priya, Shobhana Bishnoi, Santosh Kumar Vishwakarma, K. Buvaneswari, Sakshi Shastri, Somdutt Tripathi, and Abhishek Jadhav. (2025). "The Role of Participatory Approaches in Modern Agricultural Extension: Bridging Knowledge Gaps for Sustainable Farming Practices". *Journal of Experimental Agriculture International* 47 (2):204-22. <https://doi.org/10.9734/jeai/2025/v47i23281>
- Raidimi, E. N., & Kabiti, H. M. (2019). A review of the role of agricultural extension and training in achieving sustainable food security: A case of South Africa. *South African Journal of Agricultural Extension*, 47(3), 120-130. <https://doi.org/10.17159/2413-3221/2019/v47n3a520>
- SAS, (2012). Institute Inc.: SAS/STAT User's Guide: Version 9.1, SAS Institute Inc., and Cary, NC, USA. https://www.sas.com/en_us/software/stat.html
- Schyns, J. F., Hamaideh, A., Hoekstra, A. Y., Mekonnen, M. M., & Schyns, M. (2015). Mitigating the Risk of Extreme Water Scarcity and Dependency: The Case of Jordan. *Water*, 7(10), 5705-5730. <https://doi.org/10.3390/w7105705>
- Smyth, S. J., Webb, S. R., & Phillips, P. W. (2021). The role of public-private partnerships in improving global food security. *Global Food Security*, 31, 100588. <https://doi.org/10.1016/j.gfs.2021.100588>
- Tarawneh, R.A., Tarawneh, M.S., and Al-Najjar K. (2022). Agricultural Policies among Advisory and Cooperative Indicators in Jordan. *International Journal of Research - GRANTHAALAYAH*, 10 (2), 10–17. <https://doi.org/10.29121/granthaalayah.v10.i2.2022.4489>

- Tarawneh, R.A. and Al-Najjar K. (2023). Assessing the Impacts of Agricultural Loans on Agricultural Sustainability in Jordan. IOSR Journal of Economics and Finance (IOSR-JEF). Vol. 14, Issue 6 Ser. PP 49-56. <https://doi.org/10.9790/5933-1406014956>
- Tarawneh, R.A., Abu Harb, S., Dayoub, M. and Al-Najjar, K. (2025). Leveraging the bio-economy to drive sustainable development: a comprehensive review. International Journal of Agricultural Technology 21(1):327-338. <http://www.ijat-aatsea.com>
- Wiedermann, C. J., Barbieri, V., Plagg, B., Marino, P., Piccoliori, G., & Engl, A. (2022). Fortifying the Foundations: A Comprehensive Approach to Enhancing Mental Health Support in Educational Policies Amidst Crises. Healthcare, 11(10), 1423. <https://doi.org/10.3390/healthcare11101423>
- Zeng, R., Abate, M. C., Cai, B., Addis, A. K., & Dereso, Y. D. (2025). A Systematic Review of Contemporary Challenges and Debates on Chinese Food Security: Integrating Priorities, Trade-Offs, and Policy Pathways. Foods, 14(6), 1057. <https://doi.org/10.3390/foods14061057>

تحليل عوامل الإرشاد الزراعي في تعزيز سياسات الأمن الغذائي في الأردن

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المُلخَص

تهدف هذه الدراسة إلى تحليل دور الإرشاد الزراعي في دعم سياسات الأمن الغذائي من خلال تقييم مستوى معارف العاملين في مديرية زراعة عمان، وتحديد مصادر المعلومات، وقياس فعالية برامج الإرشاد، وتحديد التحديات، واقتراح حلول لتحسين الأداء. أظهرت النتائج أن 50% من الإداريين تزيد أعمارهم عن 41 عامًا ولديهم أكثر من 13 عامًا من الخبرة، وأن 56.7% من العاملين في الإرشاد الزراعي يحملون شهادة جامعية. ركز التدريب على الحفاظ على المياه (حتى 40%) وسلامة الغذاء (حتى 33.4%)، مع أعلى درجات المعرفة في إدارة الموارد المائية (2.59) وأقل الدرجات في ضبط السوق (2.33). تميزت مؤسسات الدولة في تنفيذ سياسات الأمن الغذائي، بمساهمة أعلى من الإرشاد الزراعي في التمويل (2.5 مقابل 1.93)، وجودة الغذاء (2.55 مقابل 2.05)، والمياه والزراعة المستدامة (2.5 مقابل 2.2). برزت التحديات الرئيسية في متطلبات الإنتاج (43.2%)، والبنية التحتية، والمياه (36.6%). في المقابل، كان للتحديات الطبيعية الأثر الأكبر (2.34)، مع وجود ارتباطات مهمة بين الإرشاد الزراعي ومعوقات مثل الوصول إلى المعلومات (**0.333) ومتطلبات الإنتاج (**0.344). توصي الدراسة بتعزيز دور الإرشاد الزراعي وتطوير برامج التدريب والتأهيل لتلبية متطلبات تحقيق الأمن الغذائي. كما تدعو إلى تكثيف الوعي والتنسيق بين الجهات المعنية، بالإضافة إلى تعزيز الدعم المؤسسي والمالي، لما لهما من أهمية بالغة في تذليل العقبات وتعزيز فعالية السياسات.

الكلمات المفتاحية: تمكين المزارعين، الدعم المؤسسي، التنمية المستدامة، الوعي الزراعي، التكامل المؤسسي، التحديات الزراعية، الأمن الغذائي، الإرشاد الزراعي