Research Article

A study of the Economic Returns and Added Value of Eggplant Production in Samarra District-Iraq, During the 2024 Agricultural Season

Shahlaa Kamel Ismail[1*], Safaa Hafedh Saleh[1], Mohammed Omar Sharif[1], Mahasen Mahmoud Sultan[2]

[1]Department of Agricultural Economics, College of Agriculture, Tikrit University, Tikrit, Iraq; [2]Department of Agricultural Economics, College of Agriculture and Forestry, University of Mosul, Mosul, Iraq.

Abstract | This study is applied research on the production cycle of the eggplant crop in the Salah al-Din Governorate -Samarra District in the 2024 production season. The research will also seek to trace the flow of products, demonstrate the value adding processes, the key players and their interactions with the other players, enhance the efficiency aspect in agricultural practices as well as come up with suitable solutions and recommendations that can be adopted by the policy makers. The analysis was based on quantitative mathematical analysis of the research. A questionnaire was designed and an interview was conducted on a random sample of (120) farmers. The statistical analysis program (SPSS-26) was used to analyze the collected data, and economic criteria like value added were used. The findings demonstrated that the production loop had a total cost (production and marketing) of (103,933.543) IQD/ton and made a profit of (57,303.406) IQD/ton. The mean total value added of the production loop of this crop was (79,735. 266) IQD/ton. According to the findings, the study suggested that the concerned authorities ought to offer quality products and services at affordable prices to enhance the competitiveness of agricultural units. There is no place for traditional approaches and personal estimates in the contemporary world.

Keywords
Eggplant, Agricultural, Value added, Production costs, Revenues

***Correspondence** | Shahlaa Kamel Ismail, Department of Agricultural Economics, College of Agriculture, Tikrit University, Tikrit, Iraq;
Email: shahlaa.k.es546@tu.edu.iq

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Introduction

Eggplant (*Solanum melongena* L.) is one of the economically and nutritionally important vegetable crops on the basis that it is nutritionally fortified and widely consumed in the world. It is also characterized by high productivity and high growth rate besides being a rich source of essential nutrients such as vitamins, mineral salts, water and dietary fiber (Raafat and Abu Al-Yazid, 2022). Eggplant is regarded as one of the most helpful plants in the family of Solanaceae as far as the economic values are concerned (Musa and Al-Bayati, 2010). It is the one that has the importance of having various uses of its fruits both after cooking and the production of various food products such as pickles, frozen products and canned foods. This is why different types of eggplant are cultivated under a vast number of conditions in Iraq, on open fields, on closed agricultural systems, such as plastic tunnels and greenhouses (Jaafar, 2018). The crop is grown in two major growing seasons. The planting of eggplant in the agricultural cycle begins in the early summer season and transplantation of seedlings occurs in March. The harvesting season is usually initiated during the month of end June and continues to the month of end October or even November depending on the climatic conditions.

One of the successes of any organization is the ability to appreciate its goods or services through unremitting and unrelenting measures that are focused towards enhancing both material and intangible aspects of its products or services. The reason is to ensure that satisfaction of any of the stakeholders in the institution is attained. Creation of value is a collaborative effort and the entire all members of the organization were involved in value creation. This can be achieved by an institution by providing a superior package of benefits in relation to its competitors or similar benefits at a low cost. The two approaches will be aimed at upgrading the competitive advantage of the institution and market share. These are objectives that are typically determined through varied strategic approaches, the former of which is embracing the concept of value chain (Jokung *et al.*, 2001). An institution can create value, by performing its activities in a superior manner and lower cost, compared to its competitors. This is how the strategic choice of activities will maximize and optimize the value that is created (Charles and Jones, 2006). Johnson et al. (2005: 140) pointed out that with such an analysis, relevant answers can be arrived at on which areas should be prioritized by a management structure in formulating the strategies. Consequently, the value can also be viewed as a pointer of how much a given function will assist in meeting the organizational needs in terms of its costs. In this regard, the actual prosperity experienced by an organization, and the overall value are both a gauge of how efficiently an institution is combining and using its factors of production (Rabi and Ibrahim, 2014). One of the largest contributions to the thinking of management is modern management in the value chain as the original idea formulated by Michael Porter in 1985 at Harvard business School (Lynch, 2000).

The value chain model has proven to be one of the most effective models of enhancing the performance of the manager within the framework of the contemporary manufacturing environment in which the competitive global economy in which the rivalry leaps forward with each passing minute. Here the roles of the various sectors like the agricultural sector are critically looked into and classified as either value adding activities or non-value adding activities that do not add up to the increase of productivity and profitability and thus should be minimized or eliminated (Al-Shaabani and Al-Hadidi, 2010). It is based on this intellectual basis that this study focuses on investigating the economic returns and value added of the eggplant production in the Salah al-Din Governorate (Samarra District) during the 2024 production season. The study succeeds in attaining this by estimating the cost of production, the revenues and profits in a holistic fashion and the gross and net value added. It also aims at establishing the key constrained or bottlenecks which hold back the efficiency of the production process and recommends policy proposals that could enhance economic efficiency of farmers and competitiveness of eggplant production within the local agricultural industry.

Research problem

The Iraqi agriculture economy suffers numerous local and international problems in terms of investments, technological advancements and international competitions among others. These

have brought adverse effects to the industry, and this has been causing underdevelopment particularly in the rural areas. As the manufacture of eggplant is among the important aspects of the agricultural products of Iraq, there is the acute need to investigate the production cycle of the crop in the region to discover and improve the key areas of its competitiveness and efficiency in the agricultural activity. The findings of this paper are aimed at identifying the real issues which the eggplant production cycle is encountering and proposing some of the evidence-based policies that could be used to facilitate the work of improving the performance of the agricultural sector in Iraq in general and Salah al-Din Governorate, in particular.

Importance of the research

The significance of the study is that it is researched production cycle of a crop that is regarded as one of the significant vegetable crops. It will involve a thorough examination of the production cycle of the eggplant crop in Iraq and an indication of the value added to this cycle of the crop. The key hindrances and challenges and issues that influence the different connections of the value chain of the eggplant crop can also be highlighted and conclusions and proposals can be made in regard to the reality of the study and this will assist the interested parties and organizations to devise policies to cut down the costs and achieve the value added to the agricultural sector.

Research objectives

To accomplish the above objectives, the research will be expected to calculate the economic indicators (production and marketing costs, revenues, profit, added value, competitive indicators) of the production cycle of the eggs plant and some of the indicators that add value to the production cycle and to know the most significant problems that this cycle is facing.

Research hypothesis

The main hypothesis of the research is that the inefficiency in the GDP contribution of the eggplant crop in Iraq in general and the province of Salah al-Din in particular, loss of profits and added value, and numerous challenges, obstacles and internal and external issues are the outcomes of the research.

Materials and Methods

In order to reach the objectives, the study used the mathematical method of quantitative analysis in the sense that a questionnaire was prepared and sent to the research sample and then the questionnaires analyzed with the statistical analysis program (SPSS-26) and then mathematical formulas of the economic criteria such as added value, i.e. the evaluation of what the production activity contributes to the product in accordance with the competition criteria. The equation on which this analysis is based is:

The following:

Value added = value of production – value of production requirements

Aubergine (eggplant) crop production cycle for the 2024 Season

This research requires the use of the different factors of production to examine the production cycle of an eggplant which includes labor, capital, organization, human resources, and raw materials. To find out the most significant issues, challenges, opportunities, and threats that people, involved in this production process may experience, a sample of 120 eggplant farmers of the Salah al-Din Governorate (Samarra District) was picked in the 2024 production season. The structured questionnaire and personal interviews among the farmers and workers who take part in various stages of the production cycle were used to collect the data. In this manner, some problems and issues that impacted production efficiency were identified and discussed.

As such, the research was structured into the following parts:

*__Level 1__: Types of costs for the production cycle and revenues and profits for the eggplant crop.

*__Level 2__: Economic criteria.

Level 1: Types of costs for the production cycle and revenues and profits for the eggplant crop

According to the amounts obtained from the farmers using the questionnaire form, the costs are categorized into productivity costs (fixed and variable) and marketing costs as indicated in Table 1, which are as follows:

First: Production costs: This is a total of what is required and what is expended on the production process to acquire the aspects of production and it will be broken down into costs (fixed and variable) as demonstrated in Table 1.

Table 1 *: Variable, fixed, and total expenses associated with the production of eggplant during the 2024 growing season (compiled by the researcher using the questionnaire form).*

Relative importance Fixed and variable costs	Cost per kg produced	Cost per ton produced	Cost per hectare in dinars	Costs per sample in dinars	Items of production loop costs for eggplant crop	T	United States of America
5.617	3.118	3118046.	1093000	262320000	working costs	1	Variable Costs
57203.	31755.	31755.292	11131500	2671560000	working costs	2	
1 291.	1.616	078.1616	566500	135960000	Costs of purchasing seedlings	3	
0.077	0.043	42791.	15000	3600000	Costs of transporting seedlings	4	
4008.	225.2	2225.138	780000	187200000	Costs of Dab Fertilizer	5	
7194.	3994.	3993838.	1400000	336000000	Pesticide Costs	6	
5.468	035.3	3035317.	1064000	255360000	Steroids Costs		
063.13	7252.	7251669.	2542000	610080000	Fuel and oils	7	
0.167	0.093	714.92	32500	7800000	Water and Electricity	8	
4.292	2 382	2382039.	835000	200400000	Maintenance and Repair Costs	9	
100	55.513	55512.923	19459500	4670280000	Total		
078.63	14149.	14149.598	4960000	1190400000	Family work costs (permanent)	1	Fixed Costs
26.696	5988 .	5988475.	2099200	503808000	Depreciation Costs	2	
2818.	0.632	632.168	221600	53184000	Rental Costs	3	
7.408	1.662	1661.619	582464	139791360	Interest Costs on Capital	4	
100	432.22	22431.859	7863264	1887183360	Total		
-	77945.	77944.782	27322764	6557463360	Total production costs		
Throughput			Ton/ha 350.54				
Production quantity (m^3)			Ton 84129.6				
Planted area			Hectare240				

Results and Discussion

Variable production costs

Variable production costs are divided into:

1. Automation costs: These are the costs incurred in the application of the machinery and mechanical equipment in plowing, leveling the land, and automated field operations. Table (1) identified the sample level estimate of the total costs of the leased mechanization to be 262,320,000 Iraqi dinars. Mechanization per unit cost was estimated at 1,093,000 dinars/ hectare and cost per ton of production was estimated at 3,118.046

dinars/ton or 3.118 dinars/ kg. Mechanization was ranked fourth in its relative significance of the variable elements of cost that take place in regard to about 5.617 percent of variable production costs.

2. Leased labor costs: The work element plays a significant role in the agricultural production even though manual labor has been mechanized and replaced by a machine. This expense will encompass the salaries of laborers during the process of seedling, fertilization, setting up of drip irrigation supplies and harvesting since the quantity of leased laborers at the sample level was (552.) It was also discovered as a factor that the cost of the leased work at the sample level was (26715600000) dinars, and (11131500) dinars/hectare and (31755.292) dinars/ton, and the cost of the leased work by the kg was estimated at (31.755) dinars/kg, and the costs of the leased work were first in terms of the relative significance of the variable costs at (57.203%).

3. The costs of buying seedlings: The cost of buying seedlings varies according to the type of seedlings used and the need of the dunum, as the need for one dunum of seedlings is (24000) seedlings approximately per hectare, and the average price of seedlings purchased by the farmer ranges from (400000-1400000) dinars/hectare dunum, while the cost of buying seedlings amounted to (135960000) dinars for the sample as a whole, (566500) dinars/hectare, and (1616.078) dinars/ton, and for kg it was estimated at (1.616) dinars/kg. The costs of buying seedlings ranked eighth in terms of the relative importance of variable costs at a rate of (2.911%).

4. Costs of transporting seedlings: The cost involved in transporting the seedlings is borne by the farmers and is dependent on the quantity of seedlings purchased (i.e. distance that can be covered by transport) as well as distance between point of sale of seedlings and the location of the farm. The price per hectare of land of transportation was 10-15000 Iraqi dinar, and this is the flexibility of the logistical situation on farms. The total cost of transportation of seeds in the example of the studied sample was estimated to 3,600,000 dinars, which is equal to the following: 15,000 dinars per hectare, 42.791 dinars per ton, and approximately 0.043 dinars per kilogram. The relative importance of this item is 0.077 of the total variable costs, and this comes in position nine among the items of the variable production cost.

5. Costs of buying fertilizers (dab): The eggplant crop is grown in different types of soil, provided that it is well drained and improves the soil by adding nutrients tostrengthen its strength, as dab fertilizer is added at an estimated rate of (200) kg per hectare, and most farmers rely on adding fertilizers from three to four times during the season. As for the cost of buying fertilizers, the cost of dab fertilizer was estimated at (187200000) dinars for the sample as a whole, and it was estimated at (780000) dinars/hectare, and (2225.138) dinars/ton, and the kg was estimated at (2.225) dinars/kg, and the cost of buying dab fertilizer ranked seventh in terms of relative importance of variable costs by (4.008%).

6. F - Costs of pesticides and stimulants: The eggplant crop is exposed to many plant diseases, and the cause of these diseases may be either insects or any other cause, and there are no accurate statistics in Iraq indicating the amount of crop losses due to disease (Al-Jarrah,2016: 66). Pesticides are used to eliminate or reduce the severity of the impact of these diseases on the crop, as the costs of pesticides were estimated at (336000000) dinars for the sample as a whole, and (1400000) dinars/hectare, (3993.838) dinars/ton, and for the kg was estimated at (3.994) dinars/kg, and this cost ranked third in terms of the relative importance of variable costs by (7.194%), while steroids were added from (3-4) times during the season as a solution with water. Their costs amounted to (255360000) dinars at the sample level, andsteroids (1064000) dinars/hectare, and (3035.317) dinars/ton, and for the kg was estimated at (3.035) dinars/kg and formed the

fifth place in terms of the relative importance of variable costs by (5.468%).

7. Fuel and oil costs: These are the costs that are formed as a result of the use of fuel and oil in the operation of generators and pumps that are used to irrigate agricultural land. The eggplant crop needs (3-4) riyals during the week, and farmers get fuel from local markets, as the price of buying one barrel of fuel from these markets reaches between (100-130) thousand dinars with a capacity of (220) liters, and this shows that the costs of fuel and oils were estimated at (610080000) dinars for the sample as a whole, and (2542000) dinars/hectare and (7251.669) dinars/ton, and for the kg it was estimated at (7.252) dinars/kg, respectively, and the costs of fuel and oils came in the second place in terms of the relative importance of variable costs at a rate of (13.063%).

8. Water and electricity costs: These costs are referred to as electricity pricing and mean the fees collected from farmers in the form of wages as a result of farmers' use of water, which are nominal fees, and these costs amounted to (7800000) dinars for the sample, (32500) dinars/hectare and (92.714) dinars/ton, and for the kg was estimated at (0.093) dinars/kg, and these costs constituted the ninth place in terms of the relative importance of variable costs at a rate of (0.167%).

9. Maintenance and repair costs: They are borne by farmers as a result of the exposure of the machines and equipment they own to damage due to the continuous use of agricultural operations, as it was found that the costs of maintenance and repair were estimated at (200400000) dinars at the sample level, (835000) dinars/hectare and (2382.039) dinars/ton, and for the kg was estimated at (2.382) dinars/kg, and these costs came in sixth place in terms of the relative importance of variable costs (4.292%).

Fixed production costs

This is clear in Table 1, which are classified into the following costs:

1. Costs of (permanent) family work: These are the costs related to the work force of the landowner throughout the agricultural season and will not be interrupted, and the number of permanent workers reached about (456) workers, with a monthly salary rate ranging between (250-300), and these costs were estimated at the sample level about (1190400000) dinars for the sample as a whole and (4960000) dinars/hectare, (14149.598) dinars/ton, and for the kg it was estimated at (14.149) dinars/kg, and these costs occupied the first place in terms of the relative importance of fixed costs by (63.078%).

2. Depreciation costs: The depreciation cost was calculated during the eggplant planting season, which is a maximum of eight months, according to the straight line method (straight line) on the basis of the following equation {depreciation= (asset value – debris)/useful life of the machine{, and it is clear that the costs of depreciation amounted to (503808000) dinars at the sample level, (2099200) dinars/hectare, and (5988.475) dinars/ton, and for the kg it was estimated at (5.988) dinars/kg, and these costs came in second place in terms of the relative importance of fixed costs (26.696%).

3. Rental costs: Through the questionnaire, it was found as shown in Table (1) that the amount of rental costs for the sample, dunam, ton and kg is (53184000), (55400), (632.168) and (0.632) dinars respectively, and these costs constituted the fourth rank in terms of the relative importance of fixed costs by (2.818%).

4. Interest costs on capital: These costs were calculated on the basis of the interest rate (8%), which is the average interest rate applicable to financial expenses, by collecting the fixed costs of the sample and multiplying them by the above interest rate. Table (1) indicates that the interest costs on capital amounted to (139791360) dinars for the

sample, (582464) dinars/hectare and (1661.619) dinars/ton, and for the kg it was estimated at (1.662) dinars/kg, and these costs ranked third in terms of the relative importance of fixed costs by (7.408%).

Table 2: *Marketing costs for the production cycle of the eggplant crop for the production season 2024 (prepared by researchers based on the questionnaire form).*

Relative importance of variable and fixed costs	Marketing costs per kg	Marketing costs per ton in dinars	Cost per hectare in dinars	Costs per sample in dinars	Items of marketing costs for the production cycle of the eggplant crop	T
2.964	0770.	770.240	270000	64800000	Packing boxes	1
64697.	16814.	16814.058	5894000	1414560000	Transportation costs	2
22634.	5882.	5882353.	2062000	494880000	unloading costs	3
9. 705	2.522	2522109.	884100	212184000	Commission	4
	25989.	25 988.760	9110100	2186424000	Marketing Costs	
Production quantity		84129600 kg				
Production quantity		Ton84129.6				
Planted area		Hectare240				

Second: Marketing costs: They reflect the efficiency of the marketing apparatus, as farmers market their crops to the offices of wholesalers (Al-Alawi), and Table 2 shows marketing costs that include the following types:

Transportation costs: These are the costs that are affected by the long distance between the farm and the place where the crop is sold, as the transportation costs amounted to (1414560000) dinars at the sample level, (5894000) dinars/hectare, (16814.058) dinars/ton, and (16.814) dinars/kg, and these costs constituted the first level in terms of the relative importance of the marketing costs of the farms to market to the merchant at a rate of (64.697%).

Unloading costs: These costs mean that they are the wages incurred by farmers to unload the crop at the offices of wholesalers, and the table shows that the amount of this cost amounted to (494880000) dinars for the sample and (2062000) dinars/hectare and (5882.353) dinars/ton and (5.882) dinars/kg, and the marketing costs of unloading came in second place in terms of the relative importance of the marketing costs of the farms to market to the trader at a rate of (22.634%).

Commission costs: They are the costs incurred by farmers as a result of marketing the crop to the wholesaler and are estimated at (3%) of the quantity of the marketed crop, and through reviewing the data of Table (2), it was found that the amount of marketing costs of the commission amounted to (212184000) dinars for the sample and (884100) dinars/hectare and (2522.109) dinars/ton and (2.522) dinars/kg. The marketing costs of the commission ranked third in terms of the relative importance of the marketing costs of the farmer to market the wholesaler by (9.705%).

Third: Total Costs, Revenues and Profits: The relative importance of the total costs (productivity and marketing) has been determined from the total costs, and this can be clarified through Table 3.

The data in Table 3 indicates that the total variable production costs were estimated at 4,670,280,000 dinars for the sample, 19,459,500 dinars per hectare, 55,512.923 dinars per ton, and 55.513 dinars per kilogram, ranking first in relative importance of total costs at 53.412%. The table indicates that the overall fixed production costs reached 1,887,183,360 dinars for the sample, equating to 7,863,264 dinars per hectare, 22,431.859 dinars per ton, and 22.432 dinars per kilogram. These expenses placed third in relative significance among total costs, comprising 21.583%. The chart indicates that the overall

Table 3 *: The relative importance of production costs (variable and fixed) and marketing costs in relation to the total costs, revenues and profits of the production cycle of the eggplant crop for the production season 2024 (prepared by researchers based on the questionnaire form).*

Materiality %	Average per kg in dinars	Average per ton produced in dinars	Average per hectare in dinars	Value of the sample in dinars	Vertebrae for Aubergine Crop Production Ring	T
53.412	55513.	55512.923	19459500	4670280000	Variable production costs	1
21583.	432.22	22431.859	7863264	1887183360	Fixed production costs	2
005.25	25989.	25 988.760	9110100	2186424000	Marketing Costs	3
100	103934.	103933.543	36432864	8743887360	Total costs	4
-	161237.	161236.949	56520000	13564800000	Revenues	5
-	303.57	57303.406	19459500	4820912640	Profits	6
Production quantity per			84129600kg			
Production quantity (m^3)			Ton 84129.6			
Planted area			Hectare240			

marketing expenses were estimated at 2,186,424,000 dinars for the sample, equating to 9,110,100 dinars per hectare, 25,988.760 dinars per ton, and 25.989 dinars per kilogram. These expenditures placed second in relative significance among total costs, comprising 25.005%. The table also showed that the total costs were estimated at (8743887360) dinars for the sample, (36432864) dinars/hectare, (103,933,543) dinars/ton and (103,934) dinars/kg. As for the revenues and profits of the production cycle, the eggplant crop, as it appears from the table that the total revenues were estimated at (13564800000) dinars for the sample and (56520000) dinars/hectare and (161236.949) dinars/ton and (161.237) dinars/kg, and the table also shows the total profits of the sample estimated at (4820912640) and (19459500) dinars/hectare and (57303.406) dinars/ton and (57.303) dinars/kg.

Second Level: Economic Criteria: The added value is the balance element in the production calculation for the agricultural sector or other sectors. It is clear from Table 4 that the total added value of the sample of the production cycle as a whole is (6708096000) dinars for the sample. The added value was extracted at the level of one ton of produced eggplant and was (79735.266) dinars/ton and its amount per kg was estimated at (79.735) dinars/kg. The sample achieved a net added value of (6204288000) dinars for the sample, and its amount per ton was (733746.791) dinars/ton and its amount per kg was estimated at (73.747) dinars/kg As for the average total value added, it was (71,453.004) dinars/ton and its value per kg was estimated at (71,453) dinars/kg, and it was calculated by adding the average profits and the average labor costs. The ratio of the value added to the value of production and its amount was calculated at the level of each of the sample, ton and kg was about (49,452%). This criterion shows the importance of the value added of the production value of the eggplant crop, and that when the percentage rises, it will indicate a good level of productivity in the activity of eggplant farms, while the ratio of profits to value added was (71,867%) for each of the sample, ton and kg.

Conclusions

The study concludes:

Table 4 *: Total and net added value and average total value of the crop production loop sample Eggplant for the production season 2022 (compiled by the researcher using the questionnaire form).*

Average per kg in dinars	Average per ton produced in dinars	Value of the sample in dinars	Vertebrae for Aubergine Crop Production Ring	T
735	79735.266	6708096000	Gross Value Added in Dinars	1
.747	73746.791	6204288000	Net value added	2
.453	71,453.004	-	Average Gross Value Added	3
452.	452.	452.	Ratio of value added to the value of production	4
867	867	867	Profit to Value Added Ratio	5
Production quantity per		84129600kg		
Production quantity (m^3)		Ton 84129.6		
Planted area		Hectare240		

1. Performance of the eggplant crop production cycle in Iraq (Salah). The study hypothesis asserts that the al-Din Governorate/Samarra District lacks the efficiency to optimize the use of existing resources in a manner that generates additional value and lucrative returns.

2. Through the study, we show that the production loop reached its total costs (productivity and marketing) per ton of product (109,933,543 dinars/ton) and achieved a profit of (57,303,406) dinars/ton. The estimated average total added value of the production loop for this crop was determined at (79,735,266) dinars/ton and it follows from this that the crop farmers have achieved profits and added value, but it was not profitable.

3. Lack of attention or care for harvesting and trading operations. Therefore, it is noted that the eggplant fruits do not bear the stacking operations in the packages pouring (several layers), which results in the speed of damage to the crop and not preserving it for a long time.

4. The percentage of the contribution of automated work was estimated at (6.363%) of the total costs of the work, while the percentage of the contribution of leased and family work was estimated at (93.64%) of the total costs of the work, and this indicates the dependence of the largest part of the sample on the leased work in the performance of the work of servicing the eggplant crop, which results in a rise in the level of costs and a reduction in the level of profits.

5. There is a weakness in the scientific use of pesticides by farmers, except for a few who have mastered the use of pesticides in an elaborate manner, which results in negative effects on the crop.

6. Lack of accurate marketing information, as well as the absence of a clear fixed price policy at the price level (fluctuating crop prices) in the same market. The price of the crop was (352941.18) dinars/ton as a maximum and (58823.529) dinars/ton as a minimum, which does not give a motive for the production loop of increasing the cultivated area.

Recommendations

The study recommends:

1. Focusing on delivering statistics and information on eggplant, including area, production, exports, and pricing, to assist agricultural producers, traders, extension service providers, organizations, and entities in enhancing the agricultural development of the crop.

2. Providing high-quality and affordable prod-

ucts (seedlings) and services is the ultimate strategic goal through which the economic unit (the farm) can enhance its competitive position. Traditional methods and personal guesses no longer have a place in today's world.

3. Work to encourage the cultivation of the eggplant crop in the governorate because of the good economic profit.

4. Providing the necessary material supplies and working to reduce the prices of agricultural supplies necessary to grow eggplants and provide them to farmers at acceptable prices.

5. The state encourages the acquisition of eggplant and attention to its marketing, as well as the establishment of secondary industries on agricultural waste resulting from eggplant and then raise the prices of the crop.

6. Encouraging the export of the crop by conforming to the specifications required for the global market and opening markets that accommodate exports in accordance with export standards.

7. Using different clear and supportive agricultural economic policies for this productive sector properly commensurate with the changes in the political and economic systems and the local and global changes that prevail at each stage of the time period of the main and subsidiary activities of the economic units in this field.

8. Implementing customs tariffs on imported vegetable items, particularly eggplant, to safeguard domestic production from international competition and avert price declines that may discourage farmers from cultivating this crop.

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Novelty statement

This research is one of the recent applied studies that addresses the analysis of the economic returns and added value of the eggplant crop in Salah al-Din Governorate/Samarra District for the 2024 production season. It represents a qualitative addition to the agricultural economic literature in Iraq.

The importance of this research stems from its being the first field study to apply the concept of agricultural value chain analysis to the eggplant crop, by combining quantitative mathematical analysis with applied economic analysis. The study utilized accurate field data collected from (120) farmers and analyzed using SPSS-26 to extract key economic indicators, including production costs (fixed, variable, and marketing), returns, profits, and added value. The results showed an accurate estimate of the added value of (79,735.266) dinars per ton. They also revealed structural imbalances in the efficiency of human resources, with the contribution of hired labor reaching (93.64%) of the total labor costs, in addition to weak marketing efficiency due to high transportation costs and commissions. The research's innovation extends to the applied and policy dimensions by presenting practical proposals to improve production and marketing efficiency, such as reducing the costs of agricultural inputs, encouraging agricultural processing industries, supporting crop exports, and protecting local products through appropriate customs policies. Accordingly, this research constitutes an integrated applied economic model that can be used to analyze the added value of other vegetable crops in Iraqi governorates, enhancing the competitiveness and economic sustainability of the agricultural sector.

Author's Contribution

Shahla Kamel Ismail: conceived the research idea, supervised the study's implementation, and managed the project. **Safaa Hafez Saleh**: developed the methodology, conducted the statistical analysis, collected the data, and wrote the original draft of the research. **Mohamed Omar Sharif**: validated the results and reviewed and edited the final draft. **Mahasin Mahmoud Sultan**: contributed to data collection, resource management, and preparation of tables and figures.

All authors participated in interpreting the results and approved the final version of the research before publication.

Generative Al and Al-assisted technology statement:

The authors declare that no generative Al or Al-assisted technologies were used in the preparation, analysis, writing, or editing of this manuscript. All research design, data collection, analysis, and interpretation were conducted solely by the authors.

Conflict of interest

The authors have declared no conflict of interest regarding the publication of this manuscript.

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