

## ECONOMICS OF ONION PRODUCTION

**Bassim Haleem Kshash<sup>a</sup> and Hayat Kadhun Oda<sup>b</sup>**

<sup>a</sup> College of Agriculture, Al-Qasim Green University, Babylon, Iraq

ORCID ID : <https://orcid.org/0000-0002-2553-2762>

<sup>b</sup> College of Food Science, Al-Qasim Green University, Babylon- Iraq

E-mail: [hay1963@fosci.uoqasim.edu.iq](mailto:hay1963@fosci.uoqasim.edu.iq)

Submit correspondence to: Bassim Haleem Kshash, at College of Agriculture, Al-Qasim Green University, Babylon, Iraq. E-mail: [bassim@agre.uoqasim.edu.iq](mailto:bassim@agre.uoqasim.edu.iq)

### ABSTRACT

Economics of onion production study is essential to help farmers efficiently maximize their yield and profits. The study was conducted in AL-Talee'a district, Babylon Province, Iraq, to identify economics of onion production. Sixty onion farmers were randomly selected. Cost and returns analysis indicates that the overall average cost and profit of onion production turned out to be (\$5307/ha, \$13443/ha) respectively, and Per hectare cost and profit of onion production increases with an increase in farm size. Seed accounted for the highest percentage of the total cost of production. The overall average returns and profit per hectare , benefit-cost ratio , rate of return ratio, and operating ratio of onion production , indicating that onion production was profitable. Establishment of producing and marketing cooperatives for onion farmers, government provision of onion improved seeds to farmers with low prices, can contribute to increasing return and profitability.

**Keywords:** budgetary analysis, variable cost, fixed cost, gross margin, resource use efficiency, profitability.

### 1. INTRODUCTION

Onion (*Allium cepa* L.) is one of the most popular vegetables that form the daily diet, consumed in various forms, and it is an important commercial crop that widely grown in different parts of the world. In Iraq, onion is considered one of the most important vegetable fruit crops. It ranks fifth and sixth among other vegetable crops in the cultivated area and production respectively(7). Onion productivity in Iraq is low compared with other countries (3)

With increased demand and low productivity, small-scale farmers strive to increase their production and productivity, which can achieve by efficient use of agricultural resources.

However, they could not achieve high levels of agricultural productivity due to

the un inefficient use of available agricultural resources and the difficulty of obtaining other economic resources (8, 9, 15), which leads to higher production costs and lower net returns. This calls for the evaluation of the agricultural economic policies pursued by the producers, by studying the economics of production, which involves analysis of the relationships between production input-output, and the efficient use of farm resources. Economics of onion production is essential to help farmers make sound economic decisions as well as make adjustments in their farming operations, by developing an appropriate agricultural policy, and made recommendations to efficiently maximize yield and profits to farmers.

Some recent studies have done to determine the economics of onion production (1, 2, 4- 6, 10- 14, 16), and it was found that onion production was profitable, costs of family labor, marketing, and the seed were the highest among production costs respectively, cost and profit of okra production increases with an increase in farm size.

Onion production, in Iraq, is primarily done by small-scale farmers, and there is a need to evaluate their agricultural production process to identify its efficiency and profitability. This study was undertaken to estimate costs and return of okra production determine profit measures of small-scale okra production.

## 2. MATERIALS AND METHODS

The study was conducted in the AL-Talee'a district, Babylon province, center-south of Iraq, which is located between 32° and 33.25° North latitude and 44° to 45° East longitude. Onion farmers cultivate bulbs of 1-1.5 g and diameters of 1-2 cm on furrows of (0.75 ) on both sides with 15 cm intraplate space, at 1-15 February, and harvested the yield at end of July. The population for the study consisted of 93 onion farmers in the district, who generally cultivated red onion in the same way; 13 were chosen to test the reliability of the questionnaire. From the 80 remaining's, 60 were selected at random to provide data between 1 and 15 November 2020. The instrument used was a 2-part questionnaire. The first part included socioeconomic characteristics: age, education level, the area cultivated with onion, and years of experience in onion cultivation, and. The second part included data related to costs of onion production {included; tillage costs (plowing, harrowing, and furrowing, that done by tractor), materials costs (seeds, fertilizers, pesticides, herbicides), labor costs ( land

preparation, bulbs planting, fertilizer application, pesticides, and herbicides application, weeding, watering and harvesting), irrigation costs (water pumping and river cleaning, done by machines), marketing costs ( packing and transportation)}, and marketed quantities of onion and the price that farmer receive when he sale the yield.

Data collected from the respondents were analyzed using statistical tools, such as descriptive statistics (frequency counts, percentages, and means), and economic indices like total cost, gross return, the profit, Cost-Benefit ratio, rate of Return Ratio, and operating ratio were calculated by using relevant equations analysis:

**Cost of production:** was taken into account by calculating total expenditure on labor, fertilizers, seeds, tillage, plant protection, irrigation, and marketing.

**Gross return:** were calculated by multiplying the yield of okra with the price that the farmer receives when he sale the yield.

**Profit** = total costs - total returns.

**Cost-Benefit ratio** = returns/ cost. ( is a relative measure that is used to compare benefits per unit of cost. It helps analyze the financial efficiency of the farmers, when it is greater than 1, the enterprise is profitable. Otherwise, it is not profitable)

**Rate of Return Ratio** = profit/ cost. (represents the financial empowerment for a further business venture and vice versa. It represents the return of cash to the business).

The operating ratio= cost/return. ( used to estimate the relative expenditure structure in the okra farming business, if it was lower than 1, it is profitable to invest in the project, the lower the ratio, the higher the profit ).

## 3. RESULTS AND DISCUSSION

### 3.1.Characteristics of Onion Farmers

Table I shows the selected characters of the respondents. The average age of onion farmers were (28.2) years. which implies that they are still young, in their economic active age, and energetic to meet the labor requirements in the accomplishment of farm operations, which could result in a positive effect on production(4).

The respondents were well educated with most having a secondary school and above education. Education plays a crucial role in technology dissemination and adoption, the ability of the farmer to cope with complexities of innovations, the intricacies of the product, and factor cultivations increases as the level of education increases(16).

Most were small-scale farmers based on cultivated areas, with an average of (3.1ha). Agricultural income increase with farm size, farmers benefit from larger farms, earning higher and more stable incomes (12). On years of experience in onion production, farmers had high, with an average of (14.9). This indicated that they have acquired enough knowledge and experience about onion production techniques, which enables them to set realistic time and cost targets by identifying production risks and constraints with ease( 16).

### **3.2. Cost of Onion Production**

The production costs of onion were estimated as the sum of the costs incurred on land tillage, purchase of ( bulbs, fertilization, pesticides, herbicides), irrigation , marketing, and labor charges (land preparation, bulbs planting, application of fertilizer, pesticides, and herbicides, weeding, watering, and harvesting).

The average per hectare cost on various input factors in onion production is worked out(table 1). It reveals that the overall average cost of onion production turned out to be (\$5307/ha), and was highest on large farms (7762\$) followed by medium (5315 \$) and small farms

(2847\$) respectively. Per hectare cost of onion production increases with an increase in farm size (10)

Seeds cost has the highest percentage in the total cost and constituted of (37.6%). Onion farmers in Iraq, use bulbs as seeds, which are imported from Syria and Turkish. These bulbs are often high prices, as well as, the high percentage of spoilage in them that increases the amount of bulbs purchased.

Marketing costs were ranked second and constituted (26.9%) of total onion production costs. Because there is no enough local market, farmers marketing their yield to far districts or provinces, which increases this cost. (6) found that the marketing cost was the highest and came first.

The other major component of the costs were fertilizers cost of 15.4%, labor 11.8%, tillage 6.3%, irrigation charges 1.1%, and plant protection 0.9%.

### **3.3. Returns of Onion Production**

Table 3 reveals that the overall average returns and profit per hectare of onion production were (\$ 18750, \$13443) respectively, indicating that onion production was profitable. Large farms have achieved the highest returns and profit followed by medium, and small farms respectively, this is in line with finding of (10, 19 ).

The overall average Benefit-cost ratio was 3.53, which implies that onion cultivation gives a return of \$3.52 on an investment of \$1. The rate of Return Ratio, and operating ratio, of onion production, were 3.52, 0.28, respectively, indicating that the production of onion was profitable.

#### 4. CONCLUSION AND RECOMMENDATIONS

Onion production was profitable. The overall average returns, cost, and profit per hectare of onion production were (\$18750, \$5307, \$13443) respectively, with highly Benefit-cost ratio, and rate of Return Ratio. Seeds cost has the highest percentage followed by marketing cost, they accounted of 64.5% of the total production onion cost. Cost, return, and profit of onion production increases with an increase in farm size.

To increase farmers' productivity and reduce production costs, there is a need to foster the participatory approach of onion farmers in producer and marketing cooperatives, the government should provide improved seed of onions to the farmers at low prices, a training course on onion cultivation should be organized to develop technical knowledge of onion farmers, and help them to efficient use of inputs

#### REFERENCES

- 1- Agarwal, P., and M. Kumar.(2018). An economic analysis of onion cultivation in Giridih District of Jharkhand. *Economic Affairs*, 63(3): 703-707. DOI: 10.30954/0424-2513.3.2018.15
- 2- Anjum, A., and K. Barmon.(2018). Profitability and comparative advantage of onion production in Bangladesh: an economic study in some selected areas. *The Agriculturists*, 15(2), 66-78. <https://doi.org/10.3329/agric.v15i2.35466>
- 3- AOAD( Arab Organization for Agricultural Development).(2019). Arab agricultural statistics yearbook, 37. Khartoum. <http://www.aoad.org/ASSY39/statbook39Cont.htm>
- 4- Ayinde, O. , and , T. Obalola.(2017).Effect of Socioeconomic Characteristics and income status on onion farmers risk attitude in Sokoto State, Nigeria. *Agricultura Tropica et Subtropica*, 50(3): 141–146. DOI: <https://doi.org/10.1515/ats-2017-0015>
- 5- Bapari, Y., M. Chowdhury, E. Haque, and A. Al-Mamun.(2016). Economic analysis of onion production in Sujanager and Santhia areas of Pabna, Bangladesh. *International Journal of Humanities and Social Science Invention*, 5(10): 5-12. [http://www.ijhssi.org/papers/v5\(10\)/version-4/B0510405012.pdf](http://www.ijhssi.org/papers/v5(10)/version-4/B0510405012.pdf)
- 6- Bishi, I., Dinesh and O. Singh.(2020). Assessment of cost and returns of onion growing farmers in Deogarh district, Orissa. *Journal of Pharmacognosy and Phytochemistry* ,9(4): 537- 540. DOI: <https://doi.org/10.22271/phyto.2020.v9.i4Si.12214>
- 7- CSO( Central Statistical Organization Iraq).(2021). Production of crop and vegetable for 2020 . Baghdad. <http://cosit.gov.iq/ar/agri-stat/veg-prod>
- 8- FAO(Food and Agriculture Organization of the United Nation).( 2017a). The future of food and agriculture– trends and challenges. Rome. <http://www.fao.org/3/i6583e/i6583e.pdf>
- 9- FAO(Food and Agriculture Organization of the United Nation).( 2017b). Productivity and Efficiency Measurement in Agriculture. Rome.

- <http://www.fao.org/3/ca6428en/ca6428en.pdf>
- 10- Jain, S. and J. Gupta.(2018). Benefit -Cost analysis of onion producer in Sagar district of Madhya Pradesh, India. *International Journal of Current Microbiology and Applied Sciences*,7(1):894-900. <https://www.ijcmas.com/7-1-2018/Shampi%20Jain%20and%20Jayant%20Kumar%20Gupta.pdf>
- 11- Kantariya, G., N. Ardesna, R. Vilhekar and V. Thumar.( 2018). Resource use efficiency and economics of onion cultivation in Bhavnagar district of Gujarat. *Journal of Pharmacognosy and Phytochemistry*, 7(5): 1333-1338. <https://www.phytojournal.com/archives/2018/vol7issue5/PartW/7-5-8-950.pdf>
- 12- Noack, F. and A. Larsen.(2019). The contrasting effects of farm size on farm incomes and food production. *Environmental Research Letter*,14(8), 084024. <https://doi.org/10.1088/1748-9326/ab2dbfLETTER>
- 13- Sharma, S.(2019). Economics of onion production in Sikar district of Rajasthan, India. *International Journal of Current Microbiology and Applied Sciences*,8(7) : 1440- 1450. <https://doi.org/10.20546/ijcmas.2019.807.172>
- 14- Shampi, J. and J. Gupta.( 2018). Benefit - Cost analysis of onion producer in Sagar District of Madhya Pradesh, India. *International Journal of Current Microbiology and Applied Sciences*,7(!):894-900. <https://doi.org/10.20546/ijcmas.2018.701.109>
- 15- World Bank Group. (2017). Agriculture Productivity growth in Brazil. . Washington. <http://documents1.worldbank.org/curated/en/268351520343354377/pdf/123948-WP-6-3-2018-8-39-22-AriasetalAgriculturalgrowthinBrazil.pdf>
- 16- Yahaya, K., A. Gindi, A. Buhari and H. Umar.(2019). Profit and technical efficiency estimation of onion farms in Aliero local Government Area of Kebbi State, Nigeria. *Direct Research Journal of Agriculture and Food Science*, 7(2):30-35. DOI: <https://doi.org/10.26765/DRJAFS.2019.1290>

Table 1: Socioeconomic characteristics of onion farmers(N=60)

characteristic	category	%	Mean	S.D.
Age (years)	< 25	5.00	28.2	7.6
	25 - 35	58.3		
	> 35	36.7		
Educational level	< secondary	31.7		
	secondary	55.0		
	> secondary	13.3		
Area cultivated with onion(ha)	< 2 ha	10	3.1	1.1
	2- 4 ha	73.3		
	> 4 ha	16.7		
Experiences in onion cultivation (years)	< 8	8.3	14.9	5.6
	8 - 15	35.0		
	> 15	56.7		

Table 2: Cost of onion production per hectare (\$/ha)

particulars	Farm category						Overall average	
	small		medium		large		cost	%
	cost	%	cost	%	cost	%		
Labor	429		679		763		624	11.8
Fertilizer	417		833		1208		819	15.4
Seeds	1000		1900		3083		1994	37.6
Tillage	167		333		500		333	6.3
Irrigation	46		58		67		57	1.1
Plant protection	38		54		58		50	0.9
Marketing	750		1458		2083		1430	26.9
Total	2847		5315		7762		5307	100

Table 3: Returns and profit of onion production per hectare (\$/ ha)

particulars	Farm category			Overall average
	small	medium	large	
Returns	9583	20000	26667	18750
Costs	2847	5315	7762	5307
Profit	6736	14685	18905	13443
Benefit cost ratio	3.36	3.76	3.43	3.53
Rate of Return Ratio	2.36	2.76	2.43	2.53
operating ratio	0.30	0.26	0.29	0.28