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Full Length Research Article

Economics of Cucumbers Production in Greenhouses in Beheira Governrate, Egypt

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ABSTRACT

Many problems are faced by Egyptian agriculture such as: weather and climate change, Nile river problems and water Deduction, the stability of the agricultural area where no horizontal extension, which lead to decrease the area of cucumbers cultivation in field from about 84.3 thousand acres in 2006 to about 43.8 thousand acres in 2017. Drip irrigation and greenhouses are concedred as aright solution to saving irrigation water and economize old land for other cultivations. So the research aimed to study economics of cucumbers production in greenhouses in new land in Dilangat in Beheira Governorate. The Methodology of research is based on simple and mulible regression and some of mathematical functions. *The research found some of results can be extracting some conclusions from them such as: (1) Cucumbers gown in greenhouses are high yield cultivation than whose gown in open field, Specialty that's cultivation in new land on autmn and winter Seasons. So the research concludes to incrisethe number of greenhouses in new land over the governrates of state, (2) By studingforeign trade of Egyptian cucumbers, there is decring relationship between Exported price and quantity, nabourforeign trade relationship between imported countries, there is no plan to export the Egyptian cucumbers and needed to open new markets in nabour countries because of high transpose cost. (3) It was found that 22 farmers of study samlpledid not reach the optimum production that aquals 6.67 tons/greenhouse. And 8 of them exceeded the economic productionthat aquals7.14 tons/greenhouse. They must use the optimum mixture of sources due to their prices, or the economic mixture. (4) The solutions wich suggested by cucumber farmers due to the problems faced them according to their openions frequencies may use as conclusions like Training agricultural labors to work inside greenhouses, Providing marketing information related the cucumber,Reducing costs of construction, operating, and greenhouse maintain,Providing fertilizers and pesticides at reasonable prices,Increasing the value of the provided loans,Facilitating procedures for obtaining loans, and reducing its interest rate.*

Introduction

Egyptian agriculture faces many challenges such as climate change, water Deduction and the relative stability of the agricultural area, which is not in line with the increasing demand for agricultural food products as a result of the increasing in the population, and followingthe modern agricultural techniquessuch as protected agriculture, agricultural intensification, drip irrigation, irrigation development and other agricultural methods. Modern agricultural methods are considered as one of the solutions to meet these challenges.The state has tended to establish national project to reclamationone and a half million acres ofnew land, in addition to 100 thousand greenhouses on an area of 100 thousand acres for the vegetables cultivation to provide areas of land that are used to cultivate strategic field crops and to settle integrated development agricultural communities.

The number of greenhouses in Egypt amounted to about 57.2 thousand greenhouses in 2018 on an area of about 20.3 thousand acres, of which about 28.4 thousand greenhouses specialized in cucumbersproduction on an area estimated at about 9.4 thousand acres, which constituted about 50% of the total number of greenhouses in Egypt [(11)]. Greenhousesarea is about 360 square meters, 9 x 40 meters. Greenhouses contribute to maximizing economic returns by increasing agricultural crops production, and producing fresh, high-quality and vegetables that are free from pollutants and have the ability to compete locally and internationally, due to the less use of pesticides inside the greenhouses compared to those grown in the field. This is obtaining fruits free of pesticide effects and harmless to humans and the environment, as well as preserving the environment. In addition to the high agricultural

economic yield, as vegetable crops are produced early or in the traditional offseason, and raised the productive efficiency of land and water sources, as Greenhouses depend on a drip irrigation system, which leads to saving 60% to 70% of the quantities of water consumed by field cultivation, which can be directed to reclaim more agricultural lands.

The number of greenhouses usevegetables cultivation in Beheira Governorate is about 1454 greenhouses at 2019, thecucumbers are considered the most important vegetables grown in greenhouses due to its high yield. The number of greenhouses in Beheira governorate is about 592 greenhouses [(9)], thecucumbers are grown in the field in two seasons.Summer season, which starts production from mid-April, and the Nile season, its production appears in mid-October. It is noticeable that the cucumbersproduction in the field does not long in the markets due to its depended with certain temperatures suitable for production, which leads to a short period of production in field cultivation. So,in winter season cucumbers grows in greenhouses tow rotations.

The research problem is concentrated in many challenges facing the Egyptian agricultural sector, especially in vegetable crops, where the area of cucumbers in field cultivation decreased from about 84.3 thousand acres in 2006 to about 43.8 thousand acres in 2017, which resulted in a decrease in the cucumbersproduction from about 802.6 thousand tons in 2006 to About 393.3 thousand tons in 2017 [(11)]. With the increase in population increasing pressure on the demand for agricultural products, Greenhouses is one of the modern technical that contribute to facing these challenges. In spite of that, the expansion of cucumbers cultivation in Greenhouses is not appropriate, because it is one of the domestic and export daily consumption vegetables, which requires encouraging its cultivation in greenhouses in the new land.

The research aimed to study economics of cucumbers production in greenhouses in new land in Dilangat in Beheira Governorate by studying the following subobjectives:

First: The current status of cucumbers crop in fieldvegetables cultivation in Egypt.

Second: The current status of cucumbers crop in Greenhousesvegetables cultivation in Beheira Governorate and Egypt.

Third: Foreign trade of Egyptian cucumbers.

Fourth: Indicators of efficiency and econometric estimation ofcucumbers production functions in Greenhouses of research sample in Beheira Governorate for 2019 season.

Fifth: The problems facingcucumbers farmers in greenhouses and suggested solutions according to the opinions of the research sample.

Materials and Methodology

The research relied on both descriptive and econometric economic analysis methods to achieve its objectives. Using some of simple mathematical functions that is serving the research. Simple regression functions were also used to study the effect of the time trend of the study variables, also maltible regression to study the economic factors affecting on Cucumbers production in Beheira Governorate, by using many different mathematical analytical models and selecting the best ones to determine the economic relationships included in the production functions.

Capital turnover = revenue / costs
Profitability of the investor pound = profits / costs
Depon Index = Profitability of pound / Capital turnover
Depon Index = profits ÷ revenue
Foreign trade indicators:

$$\textbf{Market share} = \frac{\text{commodity imports from Egypt}}{\text{imports of that good from the world}}$$

$$\textbf{Market penetration} \quad \frac{\text{commodity imports from Egypt}}{\text{total of that commodity in the importing country}}$$

$$\textbf{Price competitiveness} = \frac{\text{commodity export price from Egypt}}{\text{global price of that good}}$$

Table 1. Deriving the marginal effect and elasticity from mathematical formulas ofthe simple regression functions.

Forms Type	Linear Forms	Marginal Effect	Elasticity
Linear Form	$Y = \beta_o + \beta_1 X$	β_1	$\beta_1 (X/Y)$
Quadratic Form	$Y = \beta_o + \beta_1 X + \beta_2 X^2$	$\beta_1 + 2\beta_2 x$	$(\beta_1 + 2\beta_2 x)(X/Y)$
Cubic Form	$Y = \beta_o + \beta_1 X + \beta_2 X^2 + \beta_3 X^3$	$\beta_1 + 2\beta_2 x + 3\beta_3 X^2$	$(\beta_1 + 2\beta_2 x + 3\beta_3 X^2)(X/Y)$
Growth Form	$Ln\ Y = \beta_o + \beta_1 x$	$\beta_1 e^{\beta o + \beta 1 x}$	$\beta_1 X$
Semi-Logarithm	$Y = \beta_o + \beta_1 Ln\ x$	$\beta_1 (1/X)$	$\beta_1 (1/Y)$
Log-Log Power	$Ln\ Y = Ln\ \beta_o + \beta_1 Ln\ x$	$\beta_1 (Y/X)$	β_1

Source*: compiled from:*

1) *Henderson M.James and Richard E.quandt.* ***Micro Economic Theory. A mathematical Approach****.3rd.International Student Edition.1980.*
2) *https://www.ibm.com/products/****spss-statistics****/help.2020*

Data sources

The research relied on published and unpublished data collected from its various sources, economic bulletins, food balance bulletins published bythe Ministry of Agriculture, publications of the Central Agency for Public Mobilization and Statistics, in addition to primary field data obtained using a questionnaire form specially designed for this purpose.

Community of study and Research sample

Buhaira governorate devided to 16 centers in addation to Nubariarigion, vegatables greenhouses are presented in 9 centers and those are Delengat, Abo Homs, Damanhour, EteyElbaroud,Kom Hamada, ShobraKheet, KafrElDawor, ElRahmania and Abo Elmatamir were had retched about 295, 116, 48, 38, 35, 30, 19, 9 and 2 cucmber greenhouses respectively. In total were about 592 cucmber greenhouses of 1454 vegatables greenhouses. The study population was represented by cucumbersgreenhouses farmers in newland in Buhaira governorate, Delangatcenter were selected according

to its relative importance of the greenhouses number were selected about 42.57% in the governorate centers. And according to its relative importance of cucmber greenhouses number were selected about 49.83%of the cucumbers greenhouses total number in centers of Beheira governorate. Data collected from an intentional stratified research sample, mostly from ElBustanvillages, consisting of 30 farms some of them contains 7 greenhouses others contain 8, 9 and ten greenhouses. Table No. (2).

Table 2. Cucumbers greenhouses number using in centers of Beheira Governerate.

Centers	Vegatables Greenhouses	Centers Impotance %	Cucumbers Greenhouses	CucumbersImpotance %
1) Delengat	619	42.57	295	49.83
2) Abo Homs	341	23.45	116	19.59
3) Damanhour	101	6.95	48	8.11
4) EteyElbaroud	65	4.47	38	6.42
5) Kom Hamada	221	15.20	35	5.91
6) ShobraKheet	53	3.65	30	5.07
7) KafrElDawor	28	1.93	19	3.21
8) ElRahmania	24	1.65	9	1.52
9) Abo Elmatamir	2	0.14	2	0.34
Total	1454	100.00	592	-

Source: compiled from: Agriculture Directorate in Beheira, Statistics Department registry notebooks, unpublished data, 2019.

Results and Discussion

First: ***The current status of cucumbers in field cultivation of vegetables in Egypt.***

Development of area and production of vegetables in field cultivation in Egypt

The area of vegetables in field cultivation ranged from a minimum of about 1.65 million Acresin 2005 to a maximum of about 2.15 million Acres in 2009, with an annual average of about 1.94 million Acres. By estimating the generaltrendfunction, it was found that the area of vegetables in field cultivation takes significant increase at a significant level of 0.01 with an annual growth rate of about 1.14% and an annual increase of about 22.13 thousand Acres. While vegetable production ranged between a minimum of about 18.57 million tons in 2005 and a maximum of about 23.25 million tons in 2009, with an annual average of about 20.57 million tons. By estimating the generaltrendfunction, it was found that vegetable production in field cultivation takes significant increase at a significant level of 0.01, with an annual growth rate of about 0.37% and an annual increase of about 75.13 million tons. Tables numbers (3 and 4).

Development area and production of cucumbers in field cultivation in Egypt

The area of cucumbers in field cultivation ranged between a minimum of about 43.8 thousand Acres in 2017 after its maximum was about 84.3 thousand Acres in 2006, that'sproblem it self, with an annual average of about 60.8 Acres. By estimating the generaltrend function, it was found that the cucumbersarea in field cultivation takes a general declining trend at a significant level of 0.01 and at an annual rate of decrease of about 29.3% and an annual decrease of about 17.8 thousand Acres. While the production of cucumbers ranged between a minimum of about 393.3 thousand tons in 2017 after its maximum was about 802.6 thousand tons in 2006, with an annual average of about 561.7 thousand tons. By estimating the general trend function, it was found that the cucumbersproduction in field cultivation takes a general declining trend at a significant level of 0.01, at an annual rate of decrease of about 30.0%, and an annual decrease of about 168.5 thousand tons. Tables No. (3 and 4).

Cucumbers relative importance of vegetables in the field cultivation in Egypt

The maximum area planted with cucumbers reached about 5.04% of the vegetable area on 2006, and this area decreased until it accounted for about 2.34% of the vegetable area on 2017, with an average of about 3.13%, thus reaching The maximum production of cucumbers in field cultivation was about 4.23% of vegetable production on 2006, and this production decreased until it accounted for about 2.1% of vegetable production on 2014, with an average of about 2.73%, and this indicator indicates the need to take attention to increasing the area cultivated with the crop of cucumbers in field cultivation, with the ability to grow varieties on wires as in greenhouses for easy care to ensure the integrity of the exportable crop. Tables No, (3, 4).

Table 3:Relative importance of the area and production of cucumbers in the field cultivation of vegetables in Egypt for the period from 2005-2018.

Years	Vegatables		Cucumbers			Cucumbers Importance %	
	Area 1000 Acres	Production 1000 tons	Area	Production 1000 tons	Productivity tons / acre	Area %	Production %
2005	1645.9	18569.5	64.1	583.1	9.10	3.89	3.14
2006	1671.4	18965.3	84.3	802.6	9.52	5.04	4.23
2007	1724.7	19225	71.7	671.5	9.37	4.16	3.49
2008	1736.7	19473.2	67.8	595.7	8.79	3.90	3.06
2009	2151.4	23247.4	64.7	600.0	9.27	3.01	2.58
2010	2111.7	21301.9	67.2	631.4	9.40	3.18	2.96
2011	2058.7	21217.2	69.3	630.1	9.09	3.37	2.97

2012	2070.5	22548.5	62.1	587.6	9.46	3.00	2.61
2013	1982.6	21131.0	52.7	496.8	9.43	2.66	2.35
2014	2123.0	21797.5	49.7	456.7	9.19	2.34	2.10
2015	2116.7	21338.4	55.6	496.0	8.92	2.63	2.32
2016	1985.8	20025.4	52.1	484.0	9.29	2.62	2.42
2017	1871.9	19450.0	43.8	393.3	8.98	2.34	2.02
2018	1905.3	19730.0	46.5	435.3	9.36	2.44	2.21
average	1939.7	20572.9	60.8	561.7	9.24	3.13	2.73
Annual change	22.127	75.13	-17.8	-168.5	-	-	-
Growth rate	1.14	0.365	-29.3	-30.0	-	-	-

***Source**: compiled from: Ministry of agriculture and land reclamation, economic affairs sector, central administration for agricultural economy, agricultural statistics bulletin, Cairo.*

Table 4. Generaltrend functions of the area and production of cucumbers in the field cultivation of vegetables in Egypt for the period from 2005-2018.

Items	Functions	F. Ratio	R^2
Total vegatables area	$Y= 1434+149.702T-8.505T^2$	17.03**	0.756
Total cucumbers area	Ln Y=4.385-0.039T	41.29**	0.775
Total vegatables productions	$Y= 17022+1195T-74.658T^2$	10.98**	0.666
Total cucumbers production	Ln Y=6.611-0.04T	34.67**	0.743

** Significant at a level of 0.05 ** Significant at a level of 0.01*

***Source**: compiled from: Table No. (3)*

Second: ***The current status of greenhouses cucumbers and the vegetables cultivation in the greenhouses in Egypt and the Beheira Governorate.***

Development of the number and area of greenhouses planted with vegetables in Egypt

The number of vegetables greenhouses ranged between a minimum of about 32.3 thousand greenhouses on 2005, and a maximum of about 64.3 thousand greenhouses on 2014, then decreased to reach about 57.2 thousand greenhouses on 2018,with an average of about 47.9 One thousand greenhouses.The annual increase is estimated at about 12.3 thousand greenhouses, with a growth rate of about 25.7%. The greenhouse area ranged between a minimum of 12.18 million square meters on 2005, and a maximum of 30.2 million square meters on 2012, then the area decreased until it reached 20.3 million square meters on 2018. Tables No. (5 and 6).

Development the number and area of cucumbersgreenhouses in Egypt

The number of cucumbersgreenhouses ranged between a minimum of about 15.8 thousand greenhouses on 2005, and a maximum of about 37.9 thousand greenhouses on 2013 and then decreased to reach about 28.4 thousand greenhouses on 2018, with an average of about 25.2 thousand Greenhouses constituted about 52.6% of the total number of vegatablesgreenhouses, which amounted to 47.85 thousand greenhouses. The area of cucumbers greenhouses ranged between a minimum of about 5.4 million square meters on 2005, and a maximum of 13.14 million square meters on 2012, then the area decreased to reach 9.44 million square meters on 2018, with an average of about 9.06 million square meters, which constituted about 47.48% of the averagevegatables areacultivated in greenhouses. Which a montedof 19.07 million square meters. Tables No. (5 and 6).

The relative importance of the area and production of greenhouse cucumbersin Egypt

The maximum area planted with cucumbers reached about 54.58% of the area cultivated with vegetables in greenhouses in 2014, this area decreased to about 46.4% in 2017, with an average of about 47.5%. The greenhouses cucumbersproductionreachedits highest on 2007, when it reached about 123.5 thousand tons, and it constituted about 63.9% of the greenhouse vegetable production, which amounted to about 193.4 thousand tons in that year, then it decreased until it reached about 87.3 thousand tons on 2016, which accounted of about 44.6% of vegetable production in the same year, then increased until it reached about 115.8 thousand tons on 2018, as it constituted about 57.5% ofvegetablesgreenhouses production, which amounted to about 201.5 thousand tons that year, The greenhouse productivity reached its maximum on 2007, reaching about 6.75 tons / greenhouse, then it decreased to reach about 3.35 tons / greenhouse on2011. Tables No. (5 and 7).

Table 5. The relative importance of cucumbers greenhouses number and its area of vegatables greenhouses cultivation in Egypt during the period 2005-2018.

Years	Nomber of greenhouses		%	Area of greenhouses		%
	vegatables	cucumbers		vegatables	cucumbers	
	1000's	1000's		$1000m^2$	$1000m^2$	
2005	32.3	15.8	48.92	12178.4	5404.9	44.38
2006	34.3	18.7	54.52	13377.3	6462.1	48.31
2007	36.4	18.3	50.27	15526.1	8277.2	53.31
2008	39.2	20.8	53.06	19946.9	9841.2	49.34
2009	33.6	16.6	49.40	13577.9	6202.5	45.68
2010	44.1	23.4	53.06	17831.7	8257.4	46.31

2011	55.1	32.8	59.53	23803.8	11173.8	46.94
2012	61.3	33.2	54.16	30195.6	13138.3	43.51
2013	61.8	37.9	61.33	20372.9	11006.0	54.02
2014	64.3	36.1	56.14	21833.3	11915.7	54.58
2015	50.1	22.6	45.11	19551.2	8199.9	41.94
2016	48.5	22.0	45.36	19971.3	8507.5	42.60
2017	51.7	25.8	49.90	18534.7	8955.4	48.32
2018	57.2	28.4	49.65	20321.4	9435.5	46.43
average	47.85	25.17	52.60	19073	9055.5	47.48
Annual change	12.30	6.37	-	4215.13	1946.93	-
Growth rate	0.257	0.253	-	0.221	0.215	-

***Source**: Ministry of agriculture and land reclamation, economic affairs sector, agricultural statistics bulletin, Cairo.*

Table 6. Generaltrend functions cucumbers greenhouses number and its area of vegatables greenhouses cultivation in Egypt during the period 2005-2018.

Items	Functions	F. Ratio	R^2
vegatables greenhouses nomber	Ln Y = 29.32+0.257 Ln T	23.78**	0.665
cucumbers greenhouses nomber	Ln Y=15.35+0.253 Ln T	10.16**	0.458
vegatables greenhouses area	Ln Y=12463.2+0.221 Ln T	11.73**	0.494
cucumbers greenhouses area	Ln Y=5968.8+0.215 Ln T	8.94**	0.427
vegatables greenhouses productions	Ln Y=137.39+0.196 Ln T	11.07**	0.480
cucumbers greenhouses production	Not significant at a level of 0.05	-	-

** Significant at a level of 0.05 ** Significant at a level of 0.01*

***Source**: compiled from: Table No. (5)*

Table 7. The relative importance of cucumbers greenhouses production and productivity of vegatables greenhouses cultivation in Egypt during the period 2005-2018.

Years	Greenhouses productions		%	Greenhouses productivity	
	vegatables 1000 Tons	cucumbers 1000 Tons		vegatables kg/m^2	cucumbers kg/m^2
2005	125.40	62.20	49.60	10.30	11.51
2006	143.20	84.70	59.15	10.70	13.11
2007	193.40	123.50	63.86	12.46	14.92
2008	225.50	136.90	60.71	11.31	13.91
2009	156.20	82.50	52.82	11.50	13.30
2010	175.60	96.80	55.13	9.85	11.72
2011	200.60	109.90	54.79	8.43	9.84
2012	271.30	139.40	51.38	8.98	10.61
2013	236.80	142.80	60.30	11.62	12.97
2014	265.20	161.00	60.71	12.15	13.51
2015	213.40	104.10	48.78	10.91	12.70
2016	195.80	87.30	44.59	9.80	10.26
2017	192.10	99.90	52.00	10.36	11.16
2018	201.50	115.80	57.47	9.92	12.27
average	199.70	110.50	55.33	10.47	12.20

***Source**: compiled from: Ministry of agriculture and land reclamation, economic affairs sector, central administration for agricultural economy, agricultural statistics bulletin, Cairo.*

Foreign trade for Egyptian cucumbers during period of 2005-2018.

Development of exports quantity and its value

The quantity of Egyptian cucumbersexports ranged between a minimum of about 226 tons on 2005 and a maximum of about 7,939 tons in 2006, and cucumbers exports amounted about 491 tons in 2018, with an annual average of about 1517 tons, while Egyptian cucumbers exports value ranged between a minimum of about $ 105,000 on 2005 and a maximum of about $ 2,374,000 in 2006, andcucumbersexports value on 2018 amounted to about $ 528,000, with an annual average of $ 932.4,000. The export price reached its lowest level on 2006, reaching about $ 299/ton, and its maximum amounting to about $ 1,482/tonon 2011, then decreased on 2018 to about $ 1075/ton, at an average price of about $ 614.5/ton during the period from 2005- 2018. Table No. (8).

The effect of the quantitative-price relationship was evident as the export price decreased with the increase in the exported quantities. The price reached 299 $/ton at the quantity 7939 tons in 2006, compared to 465 dollars on 2005, and the exported quantity was only about 226 tons, and the export price reached 357.8 when the exported quantity 4008. Tons in 2014 after it was 1066 dollars on 2013 and the exported quantity was only about 698 tons, then the price increased to about 1474 dollars when the export quantity decreased to about 1056 tons on 2015, so must be work to increase the export quantity while competing with global prices,and working to open new markets per the global price is much higher than the local prices, which indicates the existence of a comparative advantage in the production of cucumbers locally. Table No. (8).

Table 8. The quantity and value of Egyptian cucumbers exports and export price during the period 2005-2018

Years	Quantity Tons	Value 1000$	Price $/ton
2005	226	105	464.6
2006	7939	2374	299.0
2007	307	165	537.5
2008	1035	507	489.9
2009	870	968	1112.6
2010	958	856	893.5
2011	568	842	1482.4
2012	560	558	996.4
2013	698	744	1065.9
2014	4008	1434	357.8
2015	1056	1556	1473.5
2016	1706	1487	871.6
2017	818	929	1135.7
2018	491	528	1075.4

***Source**: https://comtrade.un.org*

Geographical distribution of Egyptian cucumbers exports as an average for period from 2016-2018

By reviewing the geographical distribution of Egyptian cucumbers exports as shown in Table No. (9), it was found that Libya, Britain, Canada, Germany, Russia ranked from first to fifth in the countries importing Egyptian cucumbers, with a quantity of about 509, 170, 80, 61, 45 tons for each respectively, a percentage of about 50.68%, 16.92%, 7.93%, 6.07%, 4.48% of quantity of cucumbers export which about 1005 tons for period 2016-2018.While Saudi Arabia, Emirates, Sweden, Seychelles, and France ranked from sixth to tenth, amounted of about 32, 26, 18, 16, and 7 tons, represent about 3.18%, 2.62%, 1.76%, 1.59% and 0.65% for each respectively. Accordingly, the quantity of Egyptian cucumbers export to the most important importing and importing countries in the table amounted to about 964 tons, representing about 96% of the total Egyptian cucumbers exports as an average for the period from 2016-2018.

Competitiveness indicators: the most important importing countries from Egypt and the most important competing countries in exporting them during the average period (2016-2018) wich mentioned in tables (9 and 10), it was found that Libya is at the forefront of countries importing from Egypt, as it was found that The total imports of Libya come from Egypt in a quantity of about 509 tons, and the local production for it reached about 9.6 thousand tons, and the amount of its exports amounted to about 38 tons. The market share of Egypt's exports in the Libyan market was estimated at about 100% of the imports of the Libyan, which means that Egypt acquires on Libya's cucumbersimports market, Also, the price competitiveness index reached about 0%, which is favor of Egyptian exports as there is no price competition with other countries. Britain came in second place in terms of countries importing from Egypt, as amounted its imports from Egypt to about 170 tons, while amounted its imports from different countries of the world to about 166.4 thousand tons, and its domestic production amounted to about 53.2 thousand tons, and its exports amounted to about 1.5 thousand tons, by estimating the market share of Egyptian exports in the British market, it reached about 0.10% of British market imports, and the market penetration index reached about 0.08%, which indicates the difficulty of penetrating Egyptian exports to British market.

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Table 9. The ranking of countries importing cucumbers from Egypt and the most important international markets as an average for the period from 2016-2018.

Countries	Domestic production Tons	Exports Tons	Importing quantity (tons) Egypt	Importing quantity (tons) World countries	Average of Price $/Ton Egypt	Average of Price $/Ton Competitive countries
1) Libya	9635	38	509	509	1027	-
2) Britain	53178	1466	170	166443	1025	1698
3) Canada	60672	50117	80	54474	1034	1360
4) Germany	252019	37797	61	480451	1038	885
5) Russian	1947680	10271	45	124383	1008	825.1
6) Saudia	106881	9259	32	1791	1022	703.6
7) Emirates	35540	129	26	6319	1000	492.4
8) Sweden	39123	146	18	36287	1029	1137
9) Seychelles	-	-	16	28	1071	1189
10) France	136786	14956	7	77933	945	1154
General index	2641514	124179	964	948618	10199	9444.1

***Source**:https://comtrade.un.org*

Moreover, the price competitiveness index is favor of Egyptian exports, reaching 60.4%. Which indicates the strength of the price competitiveness of the Egyptian cucumbers in the British market, the export price of Egypt is less than that of the most important competing countries in the British market, namely Netherlands, Spain, and Germany by about 785,1027,208 dollars, a decrease of about 43.4%, 50% and 16.9% The arrangement, which enhances Egypt's chances of competing

with other countries and the possibility of increasing Egypt's opportunities in the marketed quantities of the Egyptian cucumbers in the British market, taking into account the product quality and reducing the transportation cost.

Canada came in third place in terms of countries importing Egyptian cucumbers, its domestic production amounted to about 60.7 thousand tons, and its exports amounted to about 50.1 thousand tons, while the amount of its imports from different countries of the world reached about 54.5 thousand tons, while imports from Egypt reached About 80 tons, despite the fact that the price competitiveness index is favor of Egyptian exports, reaching about 76%, which indicates the strength of the price competitiveness of Egyptian cucmber, but the market share of Egyptian exports in the Canadian market amounted to about 0.15% of the Canadian market imports. The market penetrat is about 0.12%, which indicates the difficulty of penetrating Egyptian exports to the Canadian market, despite the fact that the Egyptian cucmber export price is lower than the export prices of competing countries except Mexico, where the average export price reached 715 $/ton.

Table10. Estimating the competitiveness indicators of Egyptian cucumbers exports in the most important international markets as an average for the period (2016-2018).

Countries	importance of cucmberixports %	Market share %	Market penetrating %	Price competitive %
1) Libya	50.65	100.000	5.018	0.00
2) Britain	16.92	0.102	0.077	60.37
3) Canada	7.96	0.147	0.069	76.03
4) Germany	6.07	0.013	0.008	117.29
5) Russian	4.48	0.036	0.002	122.17
6) Saudia	3.18	1.787	0.029	145.25
7) Emirates	2.59	0.411	0.062	203.09
8) Sweden	1.79	0.050	0.024	90.50
9) Seychelles	1.59	57.143	57.143	90.08
10) France	0.70	0.009	0.003	81.89
General index	95.92	0.102	0.027	107.99

Source: *compiled from table No. (9)*

It was also found from Table No. (11) That the export cucumbersprice to Libya, Britain, Seychelles and France is lower than the average price of import from competing countries. Rather, there are no competing countries in the Libyan market for the border convergence between the two countries, and the same reason for the border convergence that Britain do with Spain, Netherlands and Germany. The reason may be the weak penetration of the British market, as amounted of exports to Britain to 170 tons compared to 166 thousand tons from competing countries at high prices. Likewise, the case with Canada, the competing countries are Spain and the neighboring countries Mexico and America, where the import price of them amounted to about 2126, 715, 1240 $/ton against the Egyptian export price of about1034 $/ton, the quantity of Egyptiancucumbers exports reached about 88 tons, compared to 54.4 thousand tons from neighboring countries. This caused a weak penetration rate into the Canadian market. As for Germany, the export price of Serbia is lower than the Egyptian export price, it reached about 424 $/ton compared to the Egyptian export price of about 1038 $/ton, and Egyptian cucumbersexports amounted to about 61 tons compared to 480 thousand tons from neighboring countries Spain, the Netherlands and Serbia, this caused the weakness penetration rate For the German market. As for Russia, Saudi and Sweden markets, Egypt has more than one competing country, for example, the Russia, in which we competed with Iran and Belarus at an average price for the 2015-2018 period of about 895,576 $/ton compared to the Egyptian export price of about1008 $/ton.

Egyptian competing countries in the Saudi market are India, Jordan and Bangladesh, at prices of about 601,779,731 $/ton compared to the Egyptian export price of about 1022 $/ton. As for Emirates market, the competing countries are Iran, India and Saudiaat prices of 422,604,451 $/ton compared to the Egyptian export price of about 1,000 $/ton. We conclude from this that the neighboring countries always have a better position for export, as proximity to the distance preserves the yield and reduce the cost of transportation. Therefore, the quantity of Egyptian exports was low compared to the quantities imported from neighboring countries despite the low Egyptian export price in most cases.

Table 11. Competitive prices matrix for Egyptian cucumbers exports to most important international markets in $/ton as an average for the period 2016-2018**.**

Exporting countries	Improting Countries									
	Lybia	**Britania**	**Canada**	**Girmany**	**Russian**	**Saudia**	**Emirates**	**Sweden**	**Seychelles**	**France**
Egypt	1027	1025	1034	1038	1008	1022	1000	1029	1071	945
Spain	-	2052	2126	1019	-	-	-	1428	1235	1010
Netherlands	-	1810	-	1213	-	-	-	1262	-	1156
Girmany	-	1233	-	-	-	-	-	721	-	-
Iran	-	-	-	-	894.7	-	422.3	-	-	-
India	-	-	-	-	-	600.7	604	-	-	-
Maxico	-	-	715	-	-	-	-	-	-	-
America	-	-	1240	-	-	-	-	-	-	-

Sebia	-	-	-	424	-	-	-	-	-	-
China	-	-	-	-	1013.7	-	-	-	-	-
Belarus	-	-	-	-	576	-	-	-	-	-
Jordan	-	-	-	-	-	779.3	-	-	-	-
Bangladesh	-	-	-	-	-	730.7	-	-	-	-
Saudia	-	-	-	-	-		451	-	-	-
Emirates	-	-	-	-	-	-	-	-	1147	-
Turkish	-	-	-	-	-	-	-	-	1185	-
Belgicko	-	-	-	-	-	-	-	-	-	1296
Price	-	1027	1092	-	-	-	-	399	164	65
deduction	-	785		175	5.7	-	-	233	76	211
fromEgypt	-	208	206	-	-	-	-	-	114	351
%Price	-	50.05	51.36	-	-	-	-	27.94	13.28	6.44
deduction	-	43.37	-	14.43	0.56	-	-	18.46	6.63	18.25
Percentage	-	16.87	16.61	-	-	-	-	-	9.62	27.08

Source: https://comtrade.un.org

Third: ***The econometric estimation of cucumbers production functions of research sample in Buhaira Governorate.***

Most of greenhouses are built on an area of 360 square meters and 60 square meters for serviceraodswith a total area of 420 square meters. The minimum number of greenhouses per acre reached 7 greenhouses and the maximum was 10 per acre. To compute economic indicators laid on analysis based on one greenhouse data for one rotationone from each farm.

The most important agricultural operations that are carried in cucumbers greenhousesof the research sample

By reviewing the data contained in Table (12), it was found that(X_1) the process of greenhouse landpreparing the included several operations such as disposing of the previous crop, plowing the greenhouse land, leveling and squaring the land, and washing the soil,that cost ranged between About 294 LE. to 515 LE.,with an average of about 361 LE., then(X_2)adding organic fertilizer to the soil,that cost ranged from about 129 LE. to about 337.5 LE., with an average of about 212 LE.,(X_3)the granular chemical fertilizers that are added to the soil such as super Phosphates, ammonia sulfate,magnesium sulfate, potassium sulfate and agricultural sulfur,thatcost ranged from 495 LE.toabout 687 LE., with an average of about 582 LE..As for(X_4)the process of germination and seedlings, it included the purchase of trays, seeds and incubation fees,its cost ranged from 2585 to about 3016 LE., with an average of about 2835 LE., then(X_5)the process of fertilizing plants that cost ranged between 350 to about 500 LE.at an average of about417. LE.,(X_6)the cost of irrigation ranged from 160 LE.to about 300 LE.with an average of about 201 LE.,(X_7)the cost of pest control and spraying pesticides ranged between 495 LE.to about 500 LE.with an average of about 437 LE.,(X_8)harvesting the crop at a cost ranged from Between 356 LE.to about 500 LE., an average of about 418 LE.,(X_9)the cost of water and energy ranged from 264 LE.to about 440 LE., with an average of about 401 LE.,Finaly (x_{10}) Labor wagesthat cost ranged between 6.41 thausand LE. to about 10.1 thausand LE. with an average of about 7.16 thaausand LE.

The production response degree to changes in most important agricultural operations cost that effects in productivity

Studying the most important factors affecting productivity does not diminish the importance of other elements that did not appear in the multiple regression functions, but rather that the absence of these factors may negatively affect productivity and some of them are an essential element in the production process such as seeds and land.

The regression functions may not show the effect of the change in the productive elements on the change in production, and the reason for the absence of those elements in the multiple regression functions is the stability of the ratios of their use or their convergence among farmers, accordingly the independent variables and the dependent variable have been determined from the data in the table number (12).

By using the double logarithmic function to determine the degree of response to changes in productivity as a result of the change in the cost of these agricultural operations, it was found that there is a strong correlation between the dependent variable and the independent variables, where the value of R was about 0.994 at the probability significant level 0.01, where the value of the F ratio was about 208.85.

The existence of a partial correlation, where the value of Durbin Watson was 1.82, from the multiple regression function that (X_2) organic fertilization, (X_3) chemical fertilizer, (X_4) planting seedlings in the greenhouse, (X_5) fertilizing plants, (X_6) irrigation, and (X_{10}) labor are agricultural operations that positively affectson the greenhouse productivity and they works efficiently and all are in the rational stage of use.

The sum of the elasticities of the function of 0.916 makes the function in stage of diminishing returns to capacity and that the adjusted determine factor R^2 was about 0.983, meaning that the independent variables explain about 98.3% of the changes in the greenhouse productivity. (X_1) preparing the greenhouse land, and (X_9) energy and water. These items should be reviewed to reduce their cost, as their elasticity was shown by negative sign. Table No. (12).

$$\begin{aligned}LnY=0.898&-0.368LnX_1+0.101LnX_2+0.386LnX_3+0.895LnX_4+0.155LnX_5+0.372LnX_6\\&\underset{(-2.54)}{-0.868LnX_9}+\underset{(1.76)}{0.243LnX_{10}}\end{aligned}$$

$$\underset{(3.57)(2.15)(1.82)(2.87)(1.91)(6.46)}{\quad}$$

$F = 208.85 \qquad R^2 = 0.983 \qquad D\text{-}W = 1.82$

Table 12. The degree of production response to changes in most important agricultural operations cost that take in the cucumbers greenhouse (Quantity: kgm, Value: LE.)

Items	Minimum LE.	Maximum LE.	Cost average LE.	Marginal productivity value	Elastisity
(X_1) greenhouse land preparing	294	515	361	-6.09	-0.368
(X_2) organic fertilization	129	337.5	212	2.84	0.101
(X_3) chemical fertilization	495	687	582	3.96	0.386
(X_4)planting seedlings	2585	3016	2835	1.89	0.895
(X_5) plants fertilizing	350	500	417	2.22	0.155
(X_6) Irrigation cost	160	300	201	11.07	0.372
(X_7) Cost of spraying pest	495	500	437	-	-
(X_8) Harvesting the crop	356	500	418	-	-
(X_9) Cost of water and energy	264	440	401	-12.92	0.868-
(x_{10}) Labor wages	6407	10100	7160	0.20	0.243
Other spends	99	116	109	-	-

Source: Calculated from research sample 2019.

The econometric estimation of the production functions of greenhouses cucumbers in the research sample of Beheira Governorate

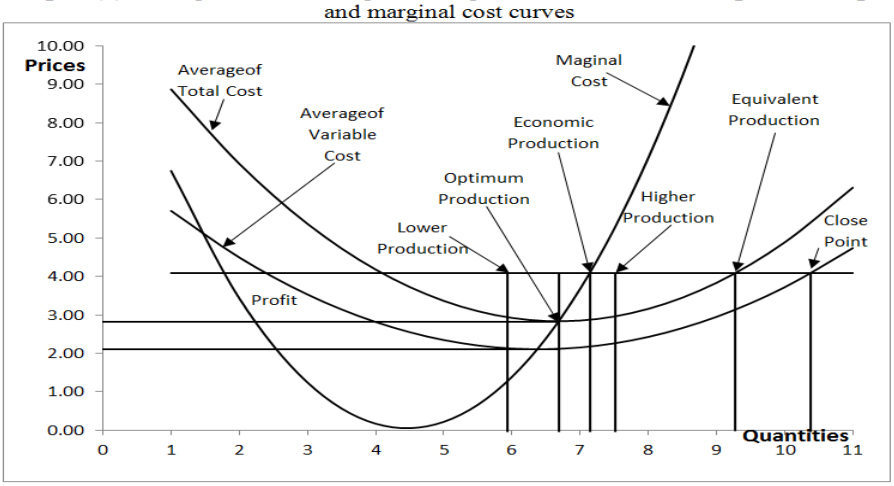
From the data provided in Table (13) it was found that the minimum production limit in the research sample farms was about 5.0 tons/greenhouse cucumbers, the upper limit of production in farms has reached of about 7.5 tons/greenhouse and the actual average production was about 5.97 tons/greenhouse. To estimate the optimal production and the economic productionof largest profit, the average of total and variable costs were calculated and the mathematical function expressing each of them was calculated, then the total costs for evry ton of production estimated for the function range, then estimate the marginal costs from total costs. Then calculate the profits at each of the optimal production, the economic production, the minimum of the sample as well as the maximum and the average of the actual sample, according to the following steps:

1) $ATC = 11.188 - 2.5\ Q + 0.187\ Q^2$
   $R = 0.938$ $R^2 = 0.879$ $F = 98.0$
2) $AVC = 7.169 - 1.585\ Q + 0.124\ Q^2$
   $R = 0.855$ $R^2 = 0.731$ $F = 36.67$
3) $AFC = 4.019 - 0.915\ Q + 0.163\ Q^2$
4) $TC = AC * Q$
5) $TC = 11.188\ Q - 2.5\ Q^2 + 0.187\ Q^3$
6) $MC = 11.188 - 5.0\ Q + 0.561\ Q^2$
7) $MC - ATC = 2.5\ Q - 0.374\ Q^2 = 0.0$
8) $MC - ATC = 2.5 - 0.374\ Q = 0.0$
9) $Q = 6.67$

Thus it was found that, the optimum production of production is equivalent about6.67tons/greenhouse. To obtain the average of variable and total costs it can be calculated for the optimum production by substituting for the quantity of 6.67 tons at the cross of the marginal cost curve with theaverage and total costs curves at the lowest point in which the cost is determined at about 2.113 2.832 thousand LE. for each of them, respectively.So the variable cost and the total cost of the optimum production reach 14.09 and 18.88 thousand LE.for each, respectively, and the revenue may reach about 27,267 thousand LE.at the average market price of 4.09 thousand LE./ton.In the same way each item ofthe costs were calculated as shown in table (13). To determine the amount of breakeven when the average variable cost curvecross the market price line, it was found that it may be 10.39 tons / greenhouse. As shown in equation below.

$4.09 = 7.169 - 1.585\ Q + 0.124\ Q^2$

Figure (1): The optimal and most profitable production estimate through the average and marginal cost curves



Source: Research sample, Excel progmam

Fourth: ***The total cucumbers farmer's efficiency indicators in the research sample***

Due to the high price of agricultural land on which greenhouses are located, and the relatively high prices of greenhouses and their industrial requirements, the land area was estimated at 420 square meters and the price of purchasing and establish the greenhouse was added, and then divided into 10 years and two rotations per year to distribute these high

investment costs on the production of 10 years, these costs called depreciation installment for the greenhouse, and if the price of the land will increase due to trend inflation, the purchase of a new greenhouse after the completion of the project will also increase. As stated in Table (13).

Fixed cost: this cost for the lowest productive greenhouse in the research sample amounted to about 5.04 thousand LE., while the highest productive greenhouse amounted to about 5.2 thousand LE., and the average of sample amounted to about 4.87 thousand LE., while the estimation of these costs for the optimal production was about 4.8 thousand LE., and for the economic production. It was estimated at 4.98 thousand LE.. Both are lower than the fixed costs of the highest productive greenhouse in sample.

Variable costs: The variable costs of the greenhouse of the lowest production of cucumbers in the research sample amounted to about 11.6 thousand LE., while these costs for the highest productive greenhouse amounted to about 17.0 thousand LE., and the average sample amounted to about 13.13 thousand LE.,while the estimate of these costs for the optimal production was estimated at 14.1 thousand LE., and for the economic production, it was estimated at 15.5 thousand LE.. Both are less than the variable costs of highest productive greenhouse in sample.

Total costs: The total costs amounted to about 16.68 thousand LE.for the lowest productive greenhouse and amounted to about 22.2 thousand LE.for the highest productive greenhouse, with an actual average of about 18.0 thousand LE., while the estimate of these costs for the optimal production was about 18.88 thousand LE., and for the economic production was estimated at 20.5 thousand LE.. Both are less than highest productive greenhouse in the sample.

Total costs average: The average of total costs per ton of cucumbers was about 3.3 thousand LE./ton for the lowest productive greenhouse, and about 2.96 thousand LE./ton for the highest productive greenhouse, with an actual average of about 3.0 thousand LE./ton, while the estimate of these costs for the optimum production was about 2.83 thousand LE., and for the economic production it was estimated at 2.87 thousand LE..

Variable costs average: The average variable costs per ton of cucumbers were about 2.3 thousand LE./ton for the lowest productive greenhouse and about 2.27 thousand LE./ton for the highest productive greenhouse, with an actual average of about 2.2 thousand LE./ton, while the estimation of these costs for the optimal product was about 2.11 thousand LE.and the economic production was estimated at 2.17 thousand LE.

Revenue: The revenue for the lowest productive greenhouse amounted to about 22.5 thousand LE., according to the average farmer selling price of 4.5 LE./kgm, and about 31.9 thousand LE.for the highest productive greenhouse at a price of 4.25 LE./kgm, with an actual average of about 24.4 thousand LE.at the average sample price of about 4.1 LE./kgm. When the optimum productionrevenue amountedto about 27.27 thousand LE., and the economic production revenue was estimated at 29.2 thousand LE..

Profits: it was found that the profits of the lowest productive greenhouses amounted to about 5.8 thousand LE.,its amounted to about 9.7 thousand LE.for the highest productive greenhouse and amounted to about 6.0 thousand LE.as an average for the research sample. Whereas, the profit estimate for the optimal production was at 8.38 thousand LE., andfor the economic production was estimated at 8.7 thousand LE..

Table 13. Optimal, economic, and average of sample production, and its costs. *(Production: kgm, Value: LE.)*

Items	Lowest production	highest production	Sample production mean	optimal production	Economic production
Variable cost (VC)	11634	17011	13133	14089	15519
Fixed cost (FC)	5042	5210	4870	4793	4981
Total cost (TC)	16676	22221	18003	18882	20500
Greenhouse production	5000	7500	5971	6667	7140
Variable cost average (AVC)	2327	2268	2199	2113	2174
Total cost average (TVC)	3335	2963	3015	2832	2871
Selling price (SP)	4.5	4.25	4.09	4.09	4.09
Revnue (R)	22500	31875	24421	27267	29203
Profits (P)	5824	9654	6001	8384	8702
Marginal Profits (MP)	10866	14864	10871	13177	13683
Capital turnover rate (CTR)	1.35	1.43	1.36	1.44	1.42
Profitability rate (PR)	0.35	0.43	0.33	0.44	0.42
Depon index (DI)	0.26	0.30	0.25	0.31	0.30

Source: *calculated from table No. (12).*

Marginal profits

Marginal profits were calculated because investment costs are paid once in the beginning of the project, and the net profits earned by the farmer each rotation amounted to about 10.9 thousand LE.for the lowest productive greenhouse and about 14.9 thousand LE.for the highest productive greenhouse with an average of about 10.9 thousand LE.. While the estimate of marginal profits for the optimal production was about 13.18 thousand pounds, and for the economic production, it was estimated at 13.68 thousand LE..

Capital turnover rate

It is the number of times that revenue can repeat costs and this criterion is a good measure of the ability of revenues to repeat the production process. It was 1.35 times the costs for the lowest productive greenhouse and 1.43 times the costs for the highestproductive greenhouse and 1.36 times at the average of

the sample. Whereas, the capital turnover rate for the optimum production was estimated at 1.44 times and for the economic production was estimated at 1.42 times.

Profitability rate: that expresses the ratio of profits to costs.Means the profits generated by one invested pound, as the minimum, maximum and average sample reached about 0.35, 0.43, and 0.33 LE.for every invested pound, respectively, while the optimum production and economic production reached about 0.44, 0.42 LE.per invested pound, respectively, which are higher than their previous counterparts.

Depon profitability index: that expresses the ratio of profits to revenues, that is, what can be deducted from revenues without being costs affected in the following rotations. This indicator reachs for minimum, maximum and average sample reached about 0.26, 0.30, 0.25 respectivly, whereas, reach about 0.31, 0.30for the optimum and the marginal product, respectively.

The conclusion of that the farmers ofgreenhouse sample whose production ranged between 5.0 and 7.5 tons/greenhouse with an average of about 5.97 tons/greenhouses neither of them achieved the optimum production nor the economic production of 6.67, 7.14 tons/greenhouse, but rather that 22 farmers did not reach the optimum production. And 8 of them exceeded the economic production, and all this reduces their relative profits according to the indicators of overall efficiency. All these Indicators for one rotation, and the production grown in tow rotations in the autumn and winter seasons foras the production of greenhouse sample will be ranged between 10.0 and 15 tons/greenhouse per the year, and the net profits earned by the farmer each rotation amounted to about 21.8 thousand LE. for the lowest productive greenhouse and about 29.8 thousand LE. for the highest productive greenhouse.

Fifth: ***The problems facing farmers of cucumber greenhouses and suggested solutions according to the opinions of the research farmrs in the 2019.***

The research aims mainly to identify the production problems facing the 30 farmers of cucumber greenhouses through a personal interview, which may negatively affect on production efficiency of cucumber. Also, the research aims to study the solutions and measures that can be taken from their opinion to confront these problems in order to raise the productive efficiency of cucmber greenhouses. The following are the problems and solutions proposed to solve them.

The most important Problems were faced greenhouse cucumbers farmers

The data contained in Table No. (10) Indicate that the most important problems facing farmers according to its relative importance due the total opinions of farmers, whose relative importance reached more than 50%, they were arranged as follows:

1) In first place:The problem of lack of agricultural labor experience in greenhouse cultivation, its importance obtained 83.3% of the total opinions of the respondents,
2) In second place: The problem of merchants' exploitation of farmers its importance obtained 73.3% of the total opinions of the respondents.
3) In third place: The problem of fluctuation and non-stability of prices, and the lack of sufficient marketing information, its importance obtained 66.6% of the total opinions of the respondents,
4) In fourth place: The problem of the high cost of construction, maintenance and operation of greenhouses, its importance obtained 63.3% of the total opinions of the respondents,
5) In fifth place: The problem of high agricultural labor wages and unavailability when needed them, its importance obtained 56.6% of the total opinions of the respondents,
6) In sixth place: The problem of high prices of pesticides and chemical fertilizers,its importance obtained 53.3% of the total opinions of the respondents.

As for the problems importance less than 50% due to farmer's opinions, they are (1) the spread of diseases and pests, (2) insufficient loans obtained (3) high interest rates, (4) difficulty in obtaining loans, as they obtained importances of about 50.0%, 46.6%, 46.6%, 40% of the total opinions of the respondents for each of them respectively.

Table 14. The most important problems facing farmers ofgreenhouses cucumbers in the study sample in 2019.

Problems	Yes	No	Importance	Chi^2
1) Lack of agricultural labor experience in greenhouse cultivation,	25	5	83.3	13.33
2) Merchants' exploitation of farmers,	22	8	73.3	6.53
3) Fluctuation and non-stability of prices, and the lack of sufficient marketing information,	20	10	66.6	3.33
4) The high cost of construction, maintenance and operation of greenhouses,	19	11	63.3	2.13
5) High agricultural labor wages and unavailability when needed them,	17	13	56.6	0.53
6) High prices of pesticides and chemical fertilizers,	16	14	53.3	0.13
7) The spread of diseases and pests,	15	15	50.0	0.00
8) Insufficient loans obtained,	14	16	46.6	0.13
9) High interest rates,	14	16	46.6	0.13
10) Difficulty in obtaining loans.	12	18	40.0	1.20

Source*: Research sample*

Proposed solutions for problems faced the cucumber farmers

Data that in table No. (15) Plan the proposed solutions for problemsfacedthe cucumber farms due to the respondents openions:

1- In first place: Training agricultural labors to work inside greenhouses, its importance obtained 73.33% of the total opinions of the respondents,

2- In second place: Helping to market the cucumbers to lake the merchants' exploitation, its importance obtained 66.67% of the total opinions of the respondents,
3- In third place: Providing marketing information related the cucumber, its importance obtained 60.0% of the total opinions of the respondents,
4- In fourth place: Reducing costs of construction, operating, and greenhouse maintain, its importance obtained 56.67% of the total opinions of the respondents,
5- In fifth place: Providing fertilizers and pesticides at reasonable prices, its importance obtained 50.0% of the total opinions of the respondents,
6- In sixth place: Increasing the value of the provided loans, its importance obtained 43.3% of the total opinions of the respondents.
7- In seventh place: Facilitating procedures for obtaining loans, its importance obtained 36.67% of the total opinions of the respondents.
8- In eighth place: Reducing the interest rate for obtaining loans, its importance obtained 36.67% of the total opinions of the respondents.

Table 15. Proposed solutions to address the problems ofgreenhouses cucumbers farmers in the 2019 study sample.

The Proposes	Frequenses	Importance	Chi^2
1) Training agricultural labors to work inside greenhouses	**22**	**73.33**	**3.27**
2) Helping to market the cucumbers to lake the merchants' exploitation	**20**	**66.67**	**1.67**
3) Providing marketing information related the cucumber	**18**	**60.0**	**0.60**
4) Reducing costs of construction, operating, and greenhouse maintain	**17**	**56.67**	**0.27**
5) Providing fertilizers and pesticides at reasonable prices	**15**	**50.0**	**0.00**
6) Increasing the value of the provided loans	**13**	**43.33**	**0.27**
7) Facilitating procedures for obtaining loans	**11**	**36.67**	**1.07**
8) Reducing the interest rate for obtaining loans	**11**	**36.67**	**1.07**

Source*: Research sample*

Conclusions

The research found some of results can be extract some conclusions from them such as:

1) Cucumbers gown in greenhouses are high yield cultivation than whose gown in open field. Spitialy in new land on autmn and winter Seasons. So the research concludes to incrise the number of greenhouses in new land over the governrates of state.

2) By studingforeign trade of Egyptian cucumbers, there is decring relationship between Exported price and quantity, nabourforeign trade relationship between imported countries, there is no plan to export the Egyptian cucumbers and needed to open new markets in nabour countries because of high transpose cost.

3) It was found that 22 farmers of study samlpledid not reach the optimum production 6.67 tons/greenhouse. And 8 of them exceeded the economic production 7.14 tons/greenhouse. They must use the optimum mixture of sources due to their prices, or the economic mixture.

4) The solutions wich suggested by cucumber farmers due to the problems faced them according to their openions frequencies may use as conclusions such as:

a. Training agricultural labors to work inside greenhouses,
b. Helping to market the cucumbers to lake the merchants' exploitation,
c. Providing marketing information related the cucumber,
d. Reducing costs of construction, operating, and greenhouse maintain,
e. Providing fertilizers and pesticides at reasonable prices,
f. Increasing the value of the provided loans,
g. Facilitating procedures for obtaining loans, and reducingits interest rate.

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