

An analytical economic study of production and export of Green beans in Egypt

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ABSTRACT

The green bean crop is considered one of the most important non-traditional crops, as well as promising agricultural crops that can contribute to achieving the objectives of the Egyptian agricultural policy in terms of global demand and the possibility of planting them throughout the year on the one hand in the three seasons. A study of the geographical distribution of Egypt's exports revealed that the most important international markets for Egyptian green beans were Italy, the United Kingdom and the Netherlands, respectively, at 17.71%, 16.93%, 11.40% of Egyptian exports of Egyptian green beans. The value of exports was about 16.74 19.83%, 7.89% of the value of Egypt's exports of green beans. Accordingly, external demand functions were estimated by estimating the model of the elasticity of substitution for Egypt and the most competitive countries of Egypt in these markets during the period 1995-2017. This indicates a significant comparative advantage in exports of Egyptian green beans. The study showed that the most important international markets for the Egyptian market are the Italian market, the UK market, the Dutch market and the identification of the most competitive markets for Egypt in these markets, it has become clear to the Italian market that Spain is Egypt's biggest competitor in the Italian market, the third place was Senegal, and the fourth rank was Ethiopia, where the relative price of export was about 1.834, 1.858, 14.271 and 18.549 respectively, which means that the increase in the export price by 10% will lead to a decrease in the exported quantity by 18.34%, 18.58%, 142.71% respectively. And that the relationship between Egypt's exports and the exports of Spain and Germany is complementary, while the current relationship between Egypt's exports and the exports of Senegal and Ethiopia and that the substitution elasticity is greater than the correct one, the demand is flexible in all countries competing with Egypt in this market. As for the UK market, Kenya is Egypt's biggest competitor, second with Guatemala, Zambia is ranked third and Zimbabwe is fourth. The relative export price is about 0.391, 2.336, 3.516 and 4.295 respectively. The ratio of Egyptian exports to Kenya, Zimbabwe and Zambia is the same as the current relationship, while the relationship between Egypt's exports and Guatemala's exports is complementary. The elasticity was less than the correct one, i.e. the demand was inflexible in Kenya, while flexibility was greater than the correct one, i.e. elastic demand in Guatemala, Zimbabwe and Zambia. As for the Dutch market, Spain is Egypt's biggest competitor in the Netherlands market. Germany is the second largest country, Kenya is third and Morocco is fourth. The replacement elasticity was found to be less than the right one Flexible competition seen in all countries to Egypt in this market.

Keywords: Domestic production, export of Green beans, Foreign markets, productivity, cultivated area, agricultural price, Net return, Quantity of Exports, The apparent comparative advantage, Egyptian green beans

Introduction

The green bean crop is considered one of the most important non-traditional crops, as well as promising agricultural crops that can contribute to achieving the objectives of the Egyptian agricultural policy in terms of global demand and the possibility of planting them throughout the year on the one hand in the three winter, The winter loop is one of the most important lugs, accounting for about 64% of the total area of green beans grown in Egypt, which allows it to export in times that may not be available to foreign markets. In the old and new lands for the total of the three lagoons about 55.20 thousand feddans with a local production volume of about 243.13 thousand tons in the average

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period (1995-2017). The crop of green beans is considered to be one of the most reliable agricultural crops. It is the third largest export of vegetable crops after potatoes and onions with an average about 20.44 thousand tons of exports. \$ 70 million in the average period of study (1995-2017), Table (3).

Problem of the study:-

In spite of the increase in Egyptian domestic production, the problem of research is the decline in the proportion of exports to domestic production, where the proportion of exports amounted to about 8% of the volume of domestic production during the study period, Table (3), and try to work on increasing the competitiveness of green beans in the most important markets of the world, especially new markets and promising.

Objective of the study:-

The study aims at identifying the potential of increasing the local production and exports of beans by studying the current status of the production of Egyptian beans, as well as studying the most important imported markets within the various economic blocs and the factors affecting these markets. Egyptian Beans.

Research Methodology and Data Sources:

The research relied on following the inductive method in the economic analysis from the descriptive point of view and following the deductive method in quantitative terms. Many analytical tools and mathematical and statistical methods were used to achieve the desired objectives of the research such as the general time trend and the simple regression of the relations between the variables. Data obtained from the Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Central Administration of Agricultural Economy, General Authority for Agricultural Budget Fund, Egyptian Fertilizer Development Center, Central Agency for Public Mobilization and Statistics, FAO, International Information Network, Ministry of Economy Foreign Trade, Ministry of Industry.

Research Findings:

First: Evolution of the productive indicators of Egyptian green beans:

Table (1) shows the development of cultivated area, productivity, total production, agricultural price, total cost, total revenue and net return in Egypt during the period 1995-2017 as follows: As shown in Table (1), the cultivated area of bean crop in Egypt ranged from a low of 37,60 thousand feddans in 1998 to a maximum of 73.02 thousand feddans in year 2007, and by estimating the general time trend equation for the development of the area cultivated for the bean crop during that period. As shown in Table (2), the cultivated area has increased by a statistically significant annual increase of 1.16 thousand feddans, equivalent to about 2.10% of the cultivated area for the bean crop, which is about 55.20 thousand feddans during the study period. It was found that the productivity of the feddan ranged between a minimum of 3.90 tons / fed in 2000 and a maximum of about 5 tons / fed in 1998 and an estimate of the time trend equation indicating an annual decrease that did not prove statistically significant during the study period. The development of the total production of green beans in Egypt fluctuated between the increase and the decrease during the study period and ranged from a minimum of 165.07 thousand tons in 1995 to a maximum of 330.26 thousand tons in 2007. In estimating the time trend equation the overall production of the green bean crop during the study period. As shown in Table (2), total production has increased by a statistical annual increase of 4.44 thousand tons, equivalent to about 1.83% of the annual average of total production of beans Green, which is about 243.13 thousand tons during the study period. As shown in Table (1), the agricultural price fluctuated between the increase and the decrease during the study period. It ranged between a minimum of 406 LE / ton in 1997 and a maximum of LE 2415 / ton in 2014. It was found that the agricultural price has increased by an annual statistical increase of about LE 100.66 / ton, equivalent to about 7.86% of the annual average of the green bean yield of LE 1281.33 / ton during the study period.¹

Table 1: Development of productive indicators of green beans in Egypt during the period 1995-2017.

Year	Cultivated Area Thousand feddan	Thousand feedan productivity Ton / feedan	Production thousand tons	Farm price Pounds/ ton	Total costs Pounds / feedan	Total revenue Pounds/ feedan	Revenue Pounds / feedan
1995	40.10	4.12	165.07	611	1197	2525	1328
1996	49.42	4.08	201.80	515	1186	2080	894
1997	44.90	4.89	219.53	406	1226	1983	757
1998	37.60	5.00	187.90	599	1667	2996	1329
1999	46.05	4.34	200.02	789	1293	3433	2140
2000	51.71	3.90	201.63	1180	1346	4578	3232
2001	50.72	4.24	214.89	944	1484	3984	2500
2002	54.90	4.25	233.53	877	1417	3729	2312
2003	64.96	4.33	281.05	804	1435	3472	2037
2004	51.37	4.87	250.07	882	1650	4320	2670
2005	52.03	4.73	245.91	763	1795	3607	1812
2006	52.41	4.95	259.61	930	1954	4651	2697
2007	73.02	4.52	330.26	1556	2080	7031	4951
2008	55.54	4.45	247.38	1472	3269	6492	3123
2009	67.60	4.19	282.90	1404	3069	5895	2826
2010	62.66	4.32	270.74	1600	3807	6878	3071
2011	70.56	4.33	305.56	2133	3967	9171	5204
2012	57.87	4.34	251.28	2303	4272	9996	5724
2013	57.16	4.50	257.47	2378	4403	10699	6296
2014	59.69	4.24	253.11	2415	4843	10868	6025
2015	58.85	4.18	245.99	2347	4672	10398	5716
2016	59.27	4.20	236.54	2410	4800	9640	4840
2017	59.55	4.35	257.15	2480	4855	9920	5065
Average	55.20	4.42	243.13	1281.33	2477.71	5656.48	3173.52

Source: The Ministry of Agriculture and Land Reclamation, Central Administration of Agricultural Economics, Agricultural Economics Bulletin, collected and calculated various numbers.

It was also found that the cost of producing feddan for green beans in Egypt fluctuated between the increase and the decrease. It ranged between a minimum of about 1186 LE / fed in 1996 and a maximum of 4843 LE / feddan in 2014, and an estimate of the general time trend equation for the evolution of crop production costs Green beans During the study period, as shown in Table (2), the cost of producing feddan has increased by an annual statistical increase of about 198.90 pounds per feddan, equivalent to about 8.33% of the annual average cost of production of green beans Amounting to LE 2477.71 / ton during the study period. In the study of the development of the total revenue per feddan of the green bean crop during the study period, as shown in Table (1), it was found that the fluctuation between the increase and the decrease ranged between a minimum of about 1983 LE / fed in 1997 and a maximum of 10868 LE / In 2014, by estimating the general time trend equation for the development of the total revenue per feddan for the green bean crop during the period referred to in Table 2, it was found that the total revenue per feddan has increased by an annual statistical increase of 449.17 pounds per feddan, equivalent to 7.94% Annual total revenue of feddan green beans grown adult And to 5656.48 pounds per acre during the study period. As for the development of the net yield of green beans during the study period (1995-2017), it was found that the fluctuation between the increase and the decrease ranged between a minimum of about 757 pounds per feddan in 1997 and a maximum of about 6296 pounds per feddan in 2013 and estimating the trend equation The general time of the development of the net yield per feddan for the green bean crop during the study period, as shown in Table (2), shows that the net revenue per feddan has increased by a statistically significant annual increase of about 249.75 pounds per feddan, equivalent to about 7.87% The annual net yield of acreage of green beans is about 3173.52 pounds per pound Dan during the study period

Table 2: Equations of the general time trend for the development of productive indicators of green beans in Egypt during the period 1995-2017.

Variable	Equation	R	f	Average	% Annual Rate of Change
% Cultivated area (Thousand feddans)	$\hat{Y} = 42.856 + 1.158x$ **(4.415)	0.520	**19.45	55.20	2.10
Production per feddan (ton / feddan)	$\hat{Y} = 4.458 + 0.004x$ **(0.322)	0.005	0.104	4.42	-
Total production (Thousand tons)	$\hat{Y} = 194.293 + 4.440x$ **(4.156)	0.476	**17.268	243.13	1.83
agricultural price (LE / ton)	$\hat{Y} = 174.119 + 100.656x$ **(10.299)	0.848	**106.066	1281.33	7.86
Total costs (LE / feddan)	$\hat{Y} = 289.814 + 198.900x$ **(10.941)	0.863	**119.710	2477.71	8.03
Total revenue (LE / fed)	$\hat{Y} = 715.619 + 449.169x$ **(11.429)	0.873	**130.615	5656.48	7.94
Net return (LE / fed)	$\hat{Y} = 426.281 + 249.749x$ **(8.081)	0.775	**65.298	3173.52	7.87

Where \hat{Y} the value of the dependent variable is the variable of time, where (1, 2, 3, ... 21).

** Significant at 0.01 level

Source: Calculated from Table (1).

Second: Development of export indicators of Egyptian green beans:

In this part of the research, the export indicators for the green bean crop during the period (1995-2017) will be studied as follows: Table (3) shows the growth in the quantity of beans exports in Egypt during the period (1995-2017). It was found that it ranged between a minimum of 3.80 thousand tons in 1999 and a maximum of 49.67 thousand tons in 2008, The total number of exports of green beans during the study period as shown in Table (4) shows that the quantity of exports of green beans in Egypt has increased by an annual statistical increase of 1.95 thousand tons, equivalent to 9.52% Exports of green bean crop of about 20.44 thousand tons during the study period. The same table shows the growth in the value of exports of green beans that fluctuated between the increase and the decrease. It ranged between a minimum of about \$ 0.95 million in 1999 and a maximum of about \$ 63.58 million in 2010 and an estimate of the general time trend equation for the development of the export value of the crop Green beans During the study period, as shown in Table 4, the value of exports of green beans has increased by an annual statistical increase of about 3.48 million dollars, equivalent to about 15.35% of the average annual export value of green beans, which is about 22.70 million \$ Over the Study period. As for the development of the export price of the ton of green bean crop, it was also shown that fluctuation between the increase and decrease ranged between a minimum of about 231.42 dollars per tonne in 2000 and a maximum of about 1994.20 dollars per ton in 2012 and an estimate of the general time trend equation for the development of the export price of tons of beans The total value of exported green beans during the study period, as shown in Table 4, shows that the export price of ton has increased by a statistical increase of about 90.57 US dollars per ton, equivalent to about 11.36% During the study period. Table (3) shows that the percentage of Egyptian exports of green beans to domestic production during the period 1995-2017 fluctuated between a minimum of 1.90% of production in 1999 and a maximum of 20.08% 2008, while the average period was about 8% of the domestic production of Egyptian green beans.

Table 3: Development of export indicators of green beans in Egypt during the period 1995-2017.

Year	Quantity of exports (thousand tons)	Value of exports (million dollars)	Export price (\$ / ton)	% of exports of domestic production	Instability coefficient		
					Quantity of exports	Export price	Quantity of production
1995	11.31	3.51	310.34	6.85	1054.08	386.71	16.94
1996	7.55	1.99	263.58	3.74	158.03	1591.60	0.67
1997	5.12	1.15	244.61	2.33	5.09	208.12	5.74
1998	5.44	1.57	288.60	2.90	20.21	76.55	11.39
1999	3.80	0.95	250.00	1.90	56.64	1.59	7.61
2000	5.92	1.37	231.42	2.94	44.72	32.84	8.74
2001	8.18	2.80	342.30	3.81	35.37	21.34	4.65
2002	6.85	1.94	283.21	2.93	53.09	46.13	1.62
2003	5.83	2.05	351.63	2.07	64.77	42.95	19.98
2004	9.23	4.64	502.71	3.69	50.09	28.88	4.77
2005	10.85	5.64	519.82	4.41	46.92	34.81	1.14
2006	24.70	11.56	468.02	9.51	10.34	47.30	4.86
2007	28.53	18.59	651.59	8.64	17.25	33.42	31.05
2008	49.67	34.84	701.43	20.08	89.02	34.39	3.54
2009	48.68	58.57	1203.16	17.21	72.48	3.75	8.44
2010	39.99	63.58	1589.90	14.77	32.55	27.16	2.04
2011	32.39	54.69	1688.48	10.60	0.85	25.92	13.27
2012	24.13	48.12	1994.20	9.60	29.16	39.31	8.36
2013	37.60	57.80	1537.23	14.60	4.42	1.00	7.60
2014	39.20	53.13	1355.36	15.49	3.28	15.95	10.59
2015	24.28	48.29	1988.88	9.87	39.15	16.78	14.45
2016	25,11	50,22	2000,11	9,16	41,21	18,41	15,12
2017	24,64	48,76	1994,44	9,57	40,11	17,25	14,10
Average	20.44	22.70	798.40	8.00	*29.34	*31.68	*6.23

* Engineering average.

Source: compiled and compiled from: United Nations Web site, www.comtrade.un.org.

Third: The instability coefficient of exports and production of Egyptian green beans:

In this section, the instability coefficients of exports, whether in terms of the development of the exported quantity or its price, or the development of the quantity of domestic production, are considered the most important indicators to judge the stability of exports in the imported markets and measure the ability of countries to meet the export requirements through the stability of domestic production and the stability of the quantity of exports, which helps decision-makers to take measures to increase the stability of exports in certain markets. The instability coefficient is calculated from the following equation:

$$\text{Coefficient of instability} = \frac{\hat{Y} - Y}{Y} \cdot 100$$

Table 3 shows that the quantity of exports, the export price and the quantity of production of green beans in all years of study were greater than zero. This means that there is a significant degree of instability. The average value of the instability coefficient of exports during the period (1995 - 2017) was about 29.34%, although there were some low years, especially in the years 1997, 2011, 2013 and 2014, where it was about 5.09%, 0.85%, 4.42% and 3.28% respectively, while the instability coefficient in some years was high. In the years 1995, 1996, 2003, 2008 and 2009, reaching about 1054.08%, 158.03%, 64.77%, 89.02% and 72.48%, respectively. In terms of export prices, there is no stability in export prices. The average of this coefficient is about 31.68%. However, there are some years, especially during the years 1999, 2009 and 2013, where this index reached 1.59%, while the instability of export prices in some years was high, such as 1995, 1996, 1997 and 1998, which reached 386.71%, 1591.60%, 208.12% and 76.55%, respectively. The instability coefficient for the green bean production during the study period was about 6.23%, which is relatively stable relative to the quantity exported and the export price. Some years were particularly low, 1996, 1997, 2001, 2002, 2004, 2005, 2006, 2008, 2010, where it reached about 0.67%, 5.74%, 4.65%, 1.62%, 4.77%, 1.14%, 4.86%, 3.54% and 2.04% respectively, while the instability coefficient in some years was as high as. In the period 1995, 2003, 2007, 2011 and 2015, reaching about 16.94%, 19.98%, 31.05%, 13.27% and

14.45%, respectively. This is due to the lack of marketing information about the export conditions of the markets, especially the promising new markets that can absorb large amounts of Egyptian green beans. Therefore, it is necessary to study the possibility of increasing the competitiveness of the crop Green beans in the most important international markets.

Table 4: Equations of the general time trend for the development of export indicators of green beans in Egypt during the period (1995-2017).

Variable	Equation	R ²	f	Average	Annual Rate of Change%
The quantity of exports (thousand tons)	$\hat{Y} = 0.966 + 1.946x$ **(8.081)	0.595	**27.950	20.44	9.52
The value of exports (million US \$)	$\hat{Y} = 15.616 + 3.484x$ **(7.837)	0.764	**61.414	22.70	15.35
Export price (US \$ / ton)	$\hat{Y} = 198.809 + 90.569x$ **(8.443)	0.790	**71.287	798.40	11.36

Where Y the value of the dependent variable, X is the variable of time, where ((1, 2, 3, ... 21).

** Significant at 0.01 level.

Source: Data from table (3)

Fourth: Geographical distribution of exports of Egyptian green beans:

Table (5) shows that the most important international markets for green beans exports in terms of quantity, value and price during the period (1995-2017). The table data indicate that the average quantity of exports of green beans is estimated at 20.44 thousand tons with an average value of 22.70 million dollars, and the average price of exporting green beans was about 798.40 dollars / ton during the study period. The same table shows that Italy is considered to be one of the main importers of green beans. The average quantity exported to Italy is about 3.62 thousand tons, representing about 17.71% of the total exported quantities of Egyptian green beans to the world. Which amounted to about 3.80 million dollars, representing about 16.74% of the annual average of the total value of exports of green beans to the world.

Table 5: Geographical distribution of Egyptian exports of Egyptian green beans in the most important international markets during the period (1995-2017).

	Country	Quantity of Exports			Value of Exports Export		Export Price	
		Thousand tons	% average annual total	state ranking	million dollars	% of the average annual gross	dollar / ton	state ranking
1	Italy	3.62	17.71	1	3.80	16.74	1049.72	5
2	United Kingdom	3.46	16.93	2	4.50	19.83	1300.58	1
3	Netherlands	2.33	11.40	3	1.79	7.89	768.24	9
4	Belgium	2.21	10.81	4	2.86	12.60	1294.12	2
5	Germany	2.02	9.88	5	2.49	10.97	1232.67	3
6	France	1.44	7.04	6	1.75	7.71	1215.28	4
7	United Arab Emirates	1.40	6.85	7	1.26	5.55	900.00	8
8	Saudi Arabia	0.500	2.45	8	0.488	2.15	976.00	7
9	Switzerland	0.385	1.88	9	0.402	1.77	1044.16	6
10	United States	0.158	0.77	10	0.106	0.47	670.89	10
11	Other States	2.92	14.28	-	3.25	14.32	6314.74	-
Total exported quantity (2017-1995)		429.24	-	-	476.7	-	16766.4	-
Annual average of total exports -1995) (2017		20.44	100	-	22.70	100	798.40	-

Source: compiled and compiled from: United Nations Web site, www.comtrade.un.org.

The average export price of beans was about \$ 1049.72. While the United Kingdom ranked second with an average volume of 3.46 thousand tons, representing 16.93%, valued at \$ 4.50 million representing 19.83% of the average value during the study period. The average price per ton was about \$ 1300.58, while the Netherlands ranked third. The average exported quantity of green beans was about 2.33 thousand tons by 11.40% and the average value of 1.79 million dollars, representing about 7.89 of the average value with an average price of about 768.24 dollars, while Belgium ranked fourth with an average quantity exported to about 2.21 thousand Ton, representing about 10.81% and remained Meh 2.86 million dollars and it increased by 12.60% at a price of about US \$ 1294.12 / ton, while Germany occupies fifth place in terms of average exported to the quantity of beans amounted to about 2.02 thousand tons by 9.88% and the value of \$ 2.49 million and increased by 10.97% and the price was about \$ 1232.67 per ton. The table also shows that about 66.73% of the average total exports of green beans are concentrated in the five countries mentioned above. The average value of exports of green beans to these countries is about 68.02% of the exports of beans in the average period (1995-2017). And then came in sixth place France with an average quantity and value of about 7.04%, 7.71%, respectively. Saudi Arabia, Switzerland and the United States ranked eighth, ninth and tenth with an average of 2.45%, 1.88% and 0.77% with an average value of 2.15% 1.77%, 0.47% respectively of the average value during the study period. Other countries also import less green beans. The average exports amount to about 2.92 thousand tons, representing about 14.28% of the average quantity of exports and an average value of about 3.25 million dollars. 14.32% of the total value of exports. For the order of countries importing green beans in terms of export price of ton in dollars are respectively the United Kingdom, Belgium, Germany, France, Italy, Switzerland, Saudi Arabia, UAE, Netherlands, United States.

Fifth: The apparent comparative advantage of Egyptian green beans:

1 - Evolution of the value of Egyptian agricultural exports and the value of exports of global green beans and the value of global agricultural exports during the period (1995-2017):

Table 6 shows that the value of Egyptian agricultural exports during the period 1995-2017 ranged from a low of about \$ 442.25 million in 1997 to a maximum of \$ 5093.66 million in 2011. By estimating the time trend equation The value of Egyptian agricultural exports during the study period as shown in Table (7) shows that the value of Egyptian agricultural exports increased by an annual statistical increase of about 252.61 million dollars, equivalent to 12.29% of the annual average of about 2054.63 million dollars. The study period also shows that the value of exports of green beans. Which ranged from a minimum of about \$ 0.18 billion in 1996 to a maximum of \$ 0.79 billion in 2013. In estimating the general time trend equation for the evolution of the value of global green bean exports, it showed a statistically significant increase of about \$ 0.03 billion a year. The equivalent of about 7.5% of the annual average of about \$ 0.44 billion during the study period. It was also shown from the same table that the value of global agricultural exports ranged between a minimum of about 411.03 billion dollars in 2000 and a maximum of about 1396.56 billion dollars in 2013 , And by estimating the general time trend equation for the evolution of global agricultural exports Table (7), showing that the global value of agricultural exports increased significantly annual increase statistically estimated at 57.62 billion dollars, equivalent to about 7.24% of the annual average of about 795.91 billion during the study period .

Table 6: Evolution of the value of Egyptian agricultural exports, the value of exports of international green beans, the value of international agricultural exports and the apparent comparative advantage of Egyptian green beans during the period 1995-2017.

Year	Value of Egyptian agricultural exports (million dollars)	Value of exports of global green beans (billion dollars)	Value of global agricultural exports (billion dollars)	The apparent comparative advantage
1995	536.12	0.19	442.89	15.34
1996	521.09	0.18	465.53	9.71
1997	442.25	0.20	457.52	6.01
1998	571.78	0.21	437.68	5.75
1999	585.76	0.20	417.12	6.91
2000	518.14	0.23	411.03	4.79
2001	620.49	0.24	414.40	7.89
2002	771.78	0.26	442.72	4.36
2003	937.75	0.35	525.35	3.28
2004	1314.30	0.38	607.39	5.64
2005	1167.54	0.45	653.54	6.95
2006	1086.38	0.46	721.47	16.84
2007	1563.41	0.55	873.29	18.95
2008	2176.84	0.59	1067.55	28.96
2009	4406.70	0.54	950.96	23.54
2010	2918.01	0.61	1084.74	38.56
2011	5093.66	0.76	1320.24	18.75
2012	4140.77	0.71	1337.67	22.02
2013	4867.29	0.79	1396.56	21.13
2014	4326.47	0.66	1314.43	24.38
2015	4580.70	0.66	1372.04	21.85
2016	4601.11	0.62	1387.11	22.90
2017	4622.12	0.65	1398.12	23.15
Average	2054.63	0.44	795.91	8.29

Source: Compiled and calculated from FAO data, International Information Network, www.fao.org.

Table 7: Equations of the general time trend for the development of the value of Egyptian agricultural exports, the value of exports of international green beans, the value of international agricultural exports and the apparent comparative advantage during the period 1995-2017.

Variable	Equation	R ²	f	Average	Annual Rate of Change%
The value of Egyptian agricultural exports (million US \$)	$Y^{\wedge} = 724.051 + 252.607 x$ **(8.956)	0.808	**80.216	2054.63	12.29
Value of global green beans exports (US \$ 1 billion)	$Y^{\wedge} = 0.080 + 0.033 x$ **(14.683)	0.919	**215.600	0.44	7.5
Value of world agricultural exports (billion dollars)	$Y^{\wedge} = 162.106 + 57.622 x$ **(12.051)	0.884	**145.217	795.91	7.24
Apparent comparative advantage (\$ million)	$Y^{\wedge} = 2.217 + 1.169 x$ **(4.182)	0.493	**17.487	8.29	14.10

Where Y^{\wedge} the value of the dependent variable is the variable of time, where ((1, 2, 3, ... 21).

** Significant at 0.01 level.

Source: Data from Table (6)

Summary and Recommendations:

The green bean crop is considered one of the most important non-traditional crops, as well as promising agricultural crops that can contribute to achieving the objectives of the Egyptian agricultural policy in terms of global demand and the possibility of planting them throughout the year on the one hand in the three winter, Glass. The objective of the study was to study the production and

export conditions of Egyptian green beans and study the external demand functions using the substitution elasticity model for export of Egyptian green beans in the most important international markets and to identify the most competitive markets for Egypt in these markets. A study of the geographical distribution of Egypt's exports revealed that the most important international markets for Egyptian green beans were Italy, the United Kingdom and the Netherlands, respectively, at 17.71%, 16.93%, 11.40% of Egyptian exports of Egyptian green beans. The value of exports was about 16.74 19.83%, 7.89% of the value of Egypt's exports of green beans. Accordingly, external demand functions were estimated by estimating the model of the elasticity of substitution for Egypt and the most competitive countries of Egypt in these markets during the period 1995-2017. A comparative study of the apparent comparative advantage of Egyptian green bean exports showed that the apparent comparative advantage index ranged between a minimum of about 3.28 million dollars in 2003 and a maximum of about 38.56 million dollars in 2010 with an average of about 8.29 million dollars during the period 1995-2017. This indicates a significant comparative advantage in exports of Egyptian green beans. The study showed that the most important international markets for the Egyptian market are the Italian market, the UK market, the Dutch market and the identification of the most competitive markets for Egypt in these markets, it has become clear to the Italian market that Spain is Egypt's biggest competitor in the Italian market, , The third place was Senegal, and the fourth rank was Ethiopia, where the relative price of export was about 1.834, 1.858, 14.271 and 18.549 respectively, which means that the increase in the export price by 10% will lead to a decrease in the exported quantity by 18.34%, 18.58%, 142.71% % Respectively.

References

- 1- United Nations, International Information Network, www.comtrade.un.org.
- 2 - Adel Mohamed Mostafa, Mahfouz Hamed El-Toukhy, Osama Ahmed El Behansawy (Doctors), El Said Awad Ibrahim, Competitiveness of some Egyptian Non-Traditional Agricultural Exports, Egyptian Association for Agricultural Economics.
- 3- Ali Abdel-Aal Khalifa (Dr.), Manal Ibrahim Mahmoud (Dr.), Competitiveness of Egyptian Potato Exports in the Major International Markets, Egyptian Journal of Agricultural Economics, Volume 26, No. 3, September 2016.
- 4- Ali Abdel Mohsen Ali (Doctor), an economic analysis of the demand for exports of Egyptian oranges in international markets, Mansoura Journal of Agricultural Economics, Volume (1), No. (5), 2014.
- 5- Food and Agriculture Organization (FAO), International Information Network, www.fao.org.
- 6- Amer Mohamed Hassan, Mohamed Ahmed Abdel Khalek: Reusing Agricultural Drainage Water, Ministry of Water Resources and Irrigation, General Authority for Drainage Projects, Agricultural Drainage Manual, First Edition, February 2003.
- 7 - Nasser Mohamed Abdel Aal Salman (Doctor), Zeinab Abdullah Ahmed (Dr.), Comparative and Competitive Advantages of Egyptian Potato Exports, Egyptian Journal of Agricultural Economics, Volume 24, No. 1, March 2014.
- 8- Khalid H .Zeghloul, Ecotoxicological recovery of Agricultural Drainage Water Impact on clarias Garipeionus in El Fayoum Governorate Egypt.2008.
- 9- Ministry of Agriculture and Land Reclamation, Central Administration of Agricultural Economics, Agricultural Economics Bulletin.
- 10- Michael Todaro and Stephen C .Smith, Economic Development, Eleventh Edition , 2012 .
- 11 - Salah Al-Alwan (Dr.), Comparative Advantage and Competitiveness of Egyptian Potato Exports in International Markets, Egyptian Journal of Agricultural Economics, Volume 26, No. (4b), December 2016.