POTENTIALS FOR BOOSTING EGYPTIAN CHAMOMILE EXPORTS

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Abstract

The current research aimed to study foreign markets importing Egyptian chamomile, to identify main variables influencing chamomile exports to major importing markets and to estimate the price elasticity of foreign demand for chamomile to help formulate proper policies for boosting export of the crop thus hard currency proceeds. Findings revealed that chamomile exports quantity and value followed declining trends, estimated at 68.2 tons and US$ 151.7 thousand per year, respectively, while export price followed an annual increasing trend estimated at US$ 86.5/ton. Germany ranked first in term of chamomile imports that accounted for 31.7% and 37.8% of the total quantity and value of Egyptian exports during the study period, respectively. Moreover, total quantity of chamomile exports to Arab markets accounted for 3.4% worth 2.6% of the total exports value.

Findings also revealed that the main variables influencing chamomile exports include produced quantity, export price and exchange rate against US Dollar for Germany, Holland and the USA, to which average exports account for 52% of Egypt's average exports for the period 2008-2018. In addition, studying evolution of monthly quantity, value and price of chamomile exports revealed that November scored the highest exported quantity, estimated at 244 tons, which export price reached US$ 2903/ton, whereas July scored the highest export value, estimated at US$ 655 thousand.

As for the price elasticity of demand for chamomile, findings revealed that it reached 1.01 for the USA, indicating that it is a promising market for increasing chamomile exports, which can be achieved by adopting a balanced price policy and satisfying the desired quality standards.

Keywords: chamomile- Egyptian exports- foreign markets

Introduction

Egypt enjoys a high advantage in exporting some non-traditional crops due to the distinguished geographic location it posses among continents of the world, which provides the country with a high competitive advantage in terms of price and quality, and allows for the production of some crops during supply shortage periods in foreign markets, which can contribute to realizing higher exports value during such periods.

It is worth mentioning that Egypt's policy aims to expand the export of agricultural crops in general, and non-traditional crops in particular, and to open new export windows for such crops. Therefore, it was necessary to conduct an economic study that focuses on the exports side of such crops in order to formulate the proper policies to follow when exporting such crops.

Medicinal plants are among the non-traditional plants which exports value can be increased. Chamomile is one of the main medicinal plants Egypt produces and exports to world markets, with average exports quantity estimated at 1422 tons worth US$ 3694 thousand for the period 2016-2218(Central Agency for Public Mobilization and Statistics,2018).

Research Problem

Despite the importance medicinal plants represent for the drug industry, chamomile exports quantity has been declining over the period 2009-2018. Therefore, the research aims to investigate the reasons for such declines.

Research Objective

The research aims to identify the main variables influencing chamomile exports, main export markets and the factors influencing exports to such markets.

Materials and Methods

Sources of Data

The research applied descriptive and quantitative analysis to the variables under study, in addition to estimating some economic indicators to assess the competitive position of Egypt's chamomile exports. Accordingly, the research applied the following:

1. Simple Regression Analysis to chamomile exports quantity, value and price over the period 2008-2018, and employing the estimated price function in estimating the price elasticity of demand for the crop under study in main export markets.

2. Studying the geographic distribution of chamomile exports to main export markets.

3. Estimating the price elasticity of demand for chamomile in main export markets.

4. Studying the main factors influencing chamomile exports in main export markets.

5. Studying the monthly distribution of chamomile exports in terms of quantity, value and export price.

In regards to sources of data, the research relied on published and unpublished secondary data extracted from the database of the Central Agency for Public Mobilization and Statistics, in addition to some other electronic websites relevant to the research subject.

Results and Discussion

Evolution of Chamomile Exports

Data in table (1) indicate that average exports of chamomile reached 1366 tons through (2008-2018), ranging between a minimum of 778 ton in 2015, 39.2% below the period's average quantity, and a maximum of 2333 tons in

2008, 70.8% above the period's average quantity. Exports value recorded a minimum of US$ 2032 thousand in 2014, with export price amounting to US$ 1251/ton, 54.9% below the period's average exports value(Central Agency for Public Mobilization and Statistics,2018).

Applying simple regression analysis to chamomile exports quantity and value revealed that they both followed declining trends at annual rates of 68.2 tons and US$ 101.7 thousand, respectively, while export price followed an increasing trend, at annual rate of US$ 86.5/ton representing 3.1% of the period's average export price per ton of chamomile.

Table 1 : Evolution of Egyptian Chamomile Exports Quantity, Value and Export Price over the Period 2008-2018

Year	Exports Quantity (Ton)	Exports Quantity (1000 US$)	Exports Value (US$/ton)
2008	2333	5294	2269
2009	1731	4291	2479
2010	1199	3214	2681
2011	899	2829	3147
2012*			
2013	830	2681	3230
2014	1624	2032	1251
2015	778	3030	3895
2016	2166	3550	1639
2017	1159	4260	3676
2018	942	3272	3473
Average	1366	3445	2774

* No data available for this year

(National Information Center, the Central Agency for Public Mobilization and Statistics, 2008-2018)

Table 2 : Estimated Simple Regression Equations for Chamomile Exports Quantity, Value and Export Price over the Period 2008-2018

Variable	Equation	R^2	Rate of Change	Significance
Exports quantity (tons)	$i = 1741.3 - 68.2 \times \acute{Y}_1$ (1.19)	0.13	5	Not significant
Exports quantity in (1000 US$)	$i = 4004.6 - 151.6 \times \acute{Y}_1$ (0.99)	0.11	3	Not significant
Exports Price (US$/ton)	$i = 2298.3 + 86.5 \times \acute{Y}_1$ (0.83)	0.08	3.1	Not significant

Calculated using data in table 3; Where $\acute{Y}_i$ is the estimated value of the dependent variable; Yi = time variable; i = years 1, 2, 3, ….. , 11 ; Value between brackets refers to (t)

Geographic Distribution of Egyptian Chamomile Exports

Studying the geographic distribution of Egyptian chamomile exports over the period 2016-2018, illustrated in table 3, indicates that average exports volume amounts to 1452.1 tons worth US$ 3765.6 thousand. As clear, Germany ranks on top of the importing markets, with average imports volume amounting to 1466 tons worth US$ 1424.1 thousand representing 31.7% and 37.8% of the total volume and value of chamomile exports, respectively. In addition, the price of Egyptian chamomile exported to Germany amounts to 3193 US$/ton, ranking second after the export price to the USA, up by 27.2% compared to the period's average export price.

The Netherlands ranks second by importing 205.9 tons worth US$ 629.5 thousand, representing 14.2% and 163.7% of the total volume and value of Egyptian chamomile exports over the study period, respectively, with export price amounting to US$ 3057/ton, up by 21.7% compared to the period's average export price. Moreover, Arab markets absorb 3.4% worth 2.6% of the total volume and value of Egyptian chamomile exports, respectively, with export price amounting to US$ 1166/ton. In addition, average export price to the USA, which amounts to US$ 4193/ton, ranks on top of the export prices over the study period, up by 67% compared to the period's average export price.

Table 3: Geographic Distribution of Egyptian Chamomile Exports over the Period 2016-2018

Market	Volume (ton)	%	Value (1000 US$)	%	Export Price (US$)
Germany	466	30.7	1424.1	37.8	3193
Netherlands	205.9	14.2	629.5	16.7	3057
Latvia	194.6	13,4	317.1	8.4	1629.5
Russia	112.4	7,7	212	5.6	1886
Spain	90.2	6.2	230	6.1	2550
China	47.7	3.3	108.2	2.9	2268.3
USA	47.7	3.3	200	5.3	4193

Arab Countries	49.6	3.4	97.5	2.6	1166
Rest of European Countries	109	7.5	281	7.5	2578
Rest of the World	149	10.3	266.2	7.1	1787
Total	1452.1	100	3765.6	100	2511

(Calculated using unpublished data obtained from the National Information Center, the Central Agency for Public Mobilization and Statistics, 2016-2018).

Main Factors Influencing Egyptian Chamomile Exports

This part of the research deals with estimating regression equations for Egyptian chamomile exports to major world markets in order to identify the relative contribution of variables that may boost the competitiveness of chamomile exports. The applied model takes the following form:

$$_3iJ \times b_3 +_{2ij} \times b_2 +_{1JK(i)} \times b_1 + \underline{\alpha} = Ý_{IK}$$

Where,

$Ý_{iK}$ = estimated exports volume of commodity J to a given market.

$X_{jk(i)}$ = export price per ton of commodity j exported to market k in US\$/year.

X_{2i} = Exchange rate per Egyptian Pound.

X_{3ij} = production quantity of the exported commodity (Chamomile).

J = exported commodity (Chamomile).

K = Export market for the exported commodity (Chamomile).

Studying Egyptian chamomile exports to major importing countries, namely Germany, Netherlands and the United States, indicates that total quantity exported to such markets, which accounts for 52% of the total average exports volume for the period 2008-2018, represent the dependent variable that is influenced by a number of explanatory variables, as indicated in table 4.

Table 4: Estimated Simple Linear Regression Equations for Chamomile Exports Quantity and Main Influencing Variables in Major Import Markets over the Period 2008-2018

Market	Equation	R^2	Significance
Germany			
Production	=300.6 +15.3 6×1Ý$_1$ (0.46)	0.026	Not significant
Export Price	2 =696 -0.11 ×Ý$_1$ (3,5)	0.6	*
Exchange Price	3 = 531.5 -11.18 ×Ý$_1$ (0.77)	0.669	Not significant
Netherlands			
Production	=23.4 +13.96 ×1Ý2 (0.85)	0.084	Not significant
Export Price	4 =328.26 -0.056 ×Ý$_2$ (2.56)	0.45	Not significant
Exchange Price	3 =138.27 +1.66 ×Ý$_2$ (0.22)	0.006	Not significant
USA			
Production	=74.51 +9.34 ×1Ý$_3$ (0.6)	0.047	Not significant
Export Price	=334.3 -0.08 ×5Ý$_3$ (1.98)	0.33	Not significant
Exchange Price	=166.7 -0.49 ×3Ý$_3$ (0.99)	0.0006	Not significant
Total Exports			
Production	=947.6 +48.7 ×1Ý$_4$ (0.58)	0.04	Not significant
Export Price	6 =2127.9 -0.5 ×Ý$_4$ (3.5)	0.6	*
Exchange Price	3 =1616.9 -27.8 ×Ý$_4$ (0.69)	0.056	Not significant

Where,
$Ý_{11}$= Estimated quantity of chamomile exports to Germany in tons.
$Ý_{2i}$ = Estimated quantity of chamomile exports to the Netherlands in tons.
$Ý_{3i}$= Estimated quantity of chamomile exports to the USA in tons. $Ý_{4i}$= Estimated quantity of total chamomile exports in tons.
X_{1i}= Produced Quantity in thousand tons per year. X_{2i}= Export Price to Germany in US\$/ton.
X_{3i}= Exchange rate against US\$. X_{4i}= Export Price to the Netherlands in US\$/ton.
X_{5i}= Export Price to the USA in US\$/ton. X_{6i} = Egypt's Average Export Price in US\$/ton.
Where i = 1, ……. , 11   ,   (*) Significant at 0.05 level
Source: (Calculated using unpublished data obtained from the National Information Center, the Central Agency for Public Mobilization and Statistics, 2008-2018).

Equations in table 4 indicate that a unit increase in production quantity leads to increasing chamomile exports to Germany, the Netherlands, and the USA and total markets by 15.36, 13.97, 9.43 and 48.7, respectively. In addition, one US$ increase in export price leads to reducing exports quantities by 0.11, 0.056, 0.08 and 0.5 tons for the same previously mentioned markets, respectively. Finally, one unit increase in exchange rate leads to increasing quantity exported to the Netherlands by 1.66 tons.

Price Elasticities of Demand for Egyptian Chamomile

Price policy is a tool that can be used for export promotion through reducing the sale price of the exported commodity. Holding all other variables constant (*ceteris paribus*), usually an inverse relationship exists between the export price and quantity demanded. However, this rule varies from one commodity to another according to the associated price elasticity of demand. In case the price elasticity of demand for a given commodity is low, an increase in price leads to higher revenue, while a decline in price leads to very limited change in the quantity demanded thus revenue. In case the price elasticity of demand for a given commodity is high, a decline in price may lead to

increased demand thus higher revenue, ceteris paribus, while an increase in price leads to reduced revenue(Shawki Amin Abd El-Azeez *et al.*, 2008).

It can be inferred from table 5 that price elasticities of demand for chamomile exports to Germany and the Netherlands have been estimated at 0.8 and 0.37, respectively, indicating that a unit decline in the export price leads to increasing chamomile exports quantity by 0.8 and 0.37 ton, respectively. Such result means that the policy of price reduction, either the export price or devaluation of Egyptian pound against hard currencies, is not that effective in increasing exports earnings. Therefore, adopting a policy that relies on ensuring stability in chamomile supply and satisfying quality standards in a given market is no doubt the right policy. It is also clear from the table that the price elasticity for demand in the USA market is high (1.01), indicating that reducing the export price might lead to increasing quantity exported to that market by 1.01%, which means that it is a promising market for chamomile exports in case a balanced policy is applied and quality standards are satisfied.

Table 5: Price Elasticities of Demand for Chamomile Exported to Main Importing Markets over the period 2008-2018

Market	Function	R^2	Significance
Germany	$\log \acute{Y}_1 = 5.35 - \log \times 0.8\ 2$	0.52	*
Netherlands	$\log \acute{Y}_2 = 3.31 - \log \times 0.37\ 4$	0.22	Not significant
USA	$\log \acute{Y}_3 = 5.48 - \log \times 1.51\ 5$	0.24	Not significant

(*) Significant at 0.05 level

Source: Calculated using unpublished data obtained from the National Information Center, the Central Agency for Public Mobilization and Statistics, 206-2018

Monthly Evolution of Chamomile Exports

Studying the monthly evolution of average export prices per ton of chamomile, exported quantities and export proceeds in order to indentify the month of highest export and best timing to realize maximum export earnings from chamomile revealed that June scored the highest average export price per ton over the study period, estimated at US$ 3660/ton; followed by July, with average export price estimated at US$ 3484/ton. On the other hand, January

scored the lowest average export price, estimated at US$ 1671/ton, as shown in table 6.

It is also clear from the table that the highest average monthly exports quantity is that recorded in November (244 tons sold at US$ 2903/ton), while the lowest exports quantity is that recorded in January (35.3 tons sold at US$ 1671/ton), and the highest exports revenue is that recorded in July, estimated US$ 655 thousand (United nationals commodity trade statistics database, 2019).

Table 6: Average Quantity and Value of Monthly Chamomile Exports over the Period 2016-2018

Variable	January	February	March	April	May	June	July	August	September	October	November	December
Exports (ton)	35.3	36,4	76.1	166	155	162	188	96.5	91.1	83.2	244	195.5
Price (US$)	1671	2073	2499	3481	2404	3660	3484	2968	3192	2913	2903	2251

Conclusion

The German market ranked first in terms of quantity and value of chamomile imports from Egypt, estimated at 31.7% and 37.8%, respectively. The estimated price elasticity of demand for the USA market reached 1.01, indicating that it is a promising market for increasing chamomile exports, which can be realized by adopting a balanced price policy and satisfying quality standards.

Summary

The research aimed to study Egyptian chamomile importing markets and identify the main factors influencing chamomile exports in such markets, in addition to estimating the price elasticity of demand in order define the right policies to adopt for increasing the country's export proceeds.

Applying simple regression analysis revealed that chamomile exports followed declining trends, at annual rates of 68.2 tons and US$ 151.7 thousand, respectively, while export price followed an increasing trend, at annual rate of US$ 86.5/ton. Germany ranked first in term of chamomile imports that accounted for 31.7% and 37.8% of total quantity and value of Egyptian exports during the study period, respectively, with average export price estimated at US$ 3193/ton. Total quantity of chamomile exports to Arab markets accounted for 3.4% worth 2.6% of the total exports value, with exports price estimated at US$ 1166/ton.

Findings revealed that main variables influencing chamomile exports quantity include produced quantity, export price and exchange rate against US$, where a unit increase in produced quantity leads to increasing quantity

exported to Germany, the Netherlands and the USA, to which average exported quantity account for 52% of the average exported quantity over the period 2008-2018, by 15.36, 13.97 and 9.34 tons, respectively. Also, a unit increase in produced quantity might lead to increasing total exports to 48.7 tons, while a unit increase in export price (one US$) might lead to reducing quantities exported to the mentioned markets by 0.11, 00.057 and 0.08 ton, respectively, and a 0.5 ton decline in total exported quantity. In addition, a unit increase in exchange rate leads to increasing quantity exported to the Dutch market by 1.66 tons.

Findings regarding monthly evolution of chamomile exports quantity, value and price revealed that November scored the highest export quantity, estimated at 224 ton, with average export price estimated at US$ 2903/ton, whereas July scored the highest proceeds of exports, estimated at US$ 655 thousand.

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