RESEARCH ARTICLE

THE FUTURE STATUS OF EGYPTIAN DATE PALM AFTER THE 2.5 MILLION PALM TREES-NATIONAL PROJECT

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ARTICLE DETAILS	ABSTRACT

Egypt stands at first place among the largest dates producing countries in the world with around 18 percent of global production in 2021. Despite its large production, Egypt accounts for less than 3 percent world exports of dates. In Egypt, dates are grown at 1.17 million acre, with 1.65 million tonnes of production. This paper examines the changing in the date sector in Egypt after the national project for the date palm cultivation; the project aims to increase 2.5 million palms from different export date palm cultivars. Several measures are used in assessing the country's competitiveness. The competitiveness of Egypt's date exports with 2.5 million palm national project and without 2.5 million palm national project in the four largest markets (Morocco, Indonesia, Malaysia and Bangladesh) were estimated during the period 2030- 2034. The results confirm that the expected market share of Egypt in the world's total imports decreased from about 2.40 percent in 2022 to reach about 1.63 percent in 2034 in the business-as-usual scenario Moreover, the results show that calculated Egypt's share of the global market during the period (2022-2034) will reach about 1.93 percent under business as usual scenario. On the other hand, it is anticipated that during the period (2030-2034) Egypt's share of the global market will reach about 10.34 percent in case all total production of the 2.5 million date palm programme is going to be directed entirely to trading, compared to 6.02 percent in case only half of the 2.5 million date palm programme total production is going to be directed entirely to trading. In addition to the above, the results reveal that Egypt has a significant comparative advantage for export dates to the international markets.

1. INTRODUCTION

Date palm is cultivated in a wide range of cropping and farming systems such as oases in the deserts, groves and home gardens, as a monocrop and an intercrop (El-Sharabasy and Rizk, 2019). Among the most produced fruits in the world, date is 17th most produced on the globe (FAO, 2020). The global production of dates in 2020 was 9.45 million tonnes from 1.45 million hectare and with an average global yield of dates at 6.84 tonnes per hectare (FAO, 2020). In 2020, the top exporters of dates, fresh or dried were Tunisia ($296 million), Saudi Arabia ($252 million), United Arab of Emirates ($235 million), Israel ($168 million), and Islamic Republic of Iran ($141 million) (FAO, 2020). Date palm is the fifth most produced fruit in the country with a total cultivated area representing about 6.7 percent of the total fruits cultivated area in 2020.

On the other hand, its rank goes second in terms of production (MALR, 2021). Egypt leads the world date palm production of about 1.71 million tonnes from 14.86 million fruitful palms cultivated in about 134.1 thousand acres in the year 2020 with an average yield of 115.07 kg/palm (MALR, 2021). Delta is the major dates productive region in Egypt followed by Middle Egypt region. Delta's Governorates produced 41 percent of the total production of the country with 136.7 kg per palm yield,

while Middle Egypt's Governorates produced 27.4 percent of the total production of the country with 130.4 kg per palm yield. Outside the Valley Governorates and Upper Egypt region are the third and fourth most dates producing regions of the country at the rates of 17.6 percent and 13.5 percent respectively (MALR, 2021).

Moreover, outside the Valley Governorates is the major date's region in terms of cultivated area followed by Upper Egypt region at the rates of 40 percent and 28 percent. Upper Egypt and Delta (Lower Egypt) regions are third and fourth most cultivated areas with 20 percent and 11.5 percent of date's total cultivated areas respectively (MALR, 2021). The area under dates expanded in all the Egyptian Governorates, 92 percent of date's cultivated area came from only 7 Governorates (Behera including Nubaria, Kafr El-shikh, Giza, Aswan, New Valley, Matruh and North Sinai. The highest cultivated area came from Giza Governorate with an area which reached 36 thousand acres, representing about 27 percent of total cultivated area in 2020.

The cultivated area under dates in New Valley Governorate came second with an area which reached 28 thousand acres representing about 21 percent of total cultivated area in 2020. Aswan Governorate came third followed by Behera Governorate and Matruh Governorate at the rates of

18 percent, 9 percent and 7 percent in 2020, respectively (MALR, 2021). Foreign agricultural trade play a main role in the national economy of Egypt, the value of exports of Egyptian dates was about 43501.53 tonnes in 2021 with about US$ 49756 thousands (CAPQ, 2021).

2. THE NATIONAL PROJECT FOR THE DATE PALM CULTIVATION

The national project for the date palm cultivation had been announced in 2018. The project aims to increase 2.5 million palms from different export date palm cultivars. The project will release date palm fruits more than the local market consumption. Consequently, it is necessary to devote the excess of dates for foreign markets which clearly requires high quality dates (Egypt presidency, 2018). The project also seeks to raise the price of unprocessed date exports by benefiting from its secondary products to maximise the added value. It is equally vital to revitalise a large industrial sector relying on palms, such as in the production of molasses and vinegar, and advance related businesses, such as packaging and marketing. The project set some ambitious plans for cultivating about 2.5 million date palms in New Valley Governorate (Toshka, Sharq El Owainat, Farafra, AinDalla) and Aswan Governorate which will be planted in an area of 40 thousand acres at a rate of 60 palm trees per acre, and which means that the labour forces in this project will reach about 120 thousand labours in the whole chain from the project set up all through harvesting, processing etc.

3. MATERIALS AND METHODS

3.1 Measuring Export Performance

Several measures are used in assessing the country's competitiveness. The indicators that are used widely in this method are: -

3.1.1 Revealed Comparative Advantage (RCA)

The Revealed Comparative Advantage Index was defined by Balassa as a measure for the export performance of individual industries in a particular country (Balassa, 1965). It is usually defined as the ratio of the share of a particular product in a country's total exports to the share of world exports of this product in the world's total exports. Numerically, the index ranges between zero and infinity. Values greater than, or equal to, one indicate that a particular country is internationally competitive or, put loosely, it has a comparative advantage inexporting that product.

Computation formula is as follow:

$$RCA = \frac{xij \, / \, Xi}{Xwj \, / \, Xij}$$

Whereas:

xij: The value of Egypt's exports of dates.

Xi: The value of Egypt's agricultural exports.

Xwj: The value of the world's exports of dates.

Xij: The value of the world's agricultural exports.

3.1.2 Market Share Index

The market share index was used as an indicator to measure the competitiveness of a particular commodity. The commodity loses its competitiveness when its share of total exports decreases.

The market share index was measured by Paul W. Farris et al.(2008) as follow.

$$MS = (\, xi \, / \, mi * 100)$$

whereas:

xi = The country's exports of commodity i to the target market.

mi = Total target market imports of commodity i.

3.1.3 Export Instability Coefficient

The export instability index was measured by the (Knudsen and Parens, 1975). Calculating the instability coefficient is one of the important indicators through which it is possible to identify the extent of the continuity and stability of exports of a particular commodity to a particular market and the extent of its fluctuation whether in quantity or value, which can help in correctly designing and setting policies to encourage exports to that market. The degree of stability of foreign trade is measured by estimating the stability coefficient, which reflects the extent of stability and stability in commercial transactions. If the value of the coefficient is zero, then this means stability of the phenomenon under study, and whenever the value of the coefficient differs from zero negatively or positively, there is no stability (regardless of the sign)

The instability coefficient calculation followed the formula of:

$$I.C = \frac{|Y_i - \hat{Y}_i|}{\hat{Y}_i} * 100$$

Whereas:

I.C = Instability coefficient.

Y_i = The actual value of the export value in year i.

$\hat{Y}i$ = Estimated value of the export value in year i.

3.1.4 Index of Export Market Penetration

Brenton and Newfarmer construct an index of export market penetration that measures the extent to which a country is actually exploiting the market opportunities from the existing set of export product (Brenton and Newfarmer, 2007). Countries that only export to a small number of the overseas markets which import the products that the country exports will have a low value of the index.

Index of export market penetration is given by:

$$MPRij = \frac{MijK}{(Qij + Mij) - Xij}$$

Whereas :

MPRij = The penetration rate of the commodity (j) into the country's market (i).

MijK = Country imports (i) of commodity (j) from exporting country K.

Qij = Production of the country (i) of the commodity (j).

Mij = Total imports for country (i) of the commodity (j).

Xij = Country's exports (i) of commodity (j).

3.1.5 The Import–Export Correspondence Index "Cosine "

Linnemann and Van Beers introduced two alternative measures for the degree of commodity correspondence between the exports of a country and the imports of another country (Linnemann and Van Beers, 1987). The import–export correspondence index COS was developed originally (Linnemann, 1966);

The indicator is calculated by the following equation:

$$COSINE_{ik} = \in X_{ik} * M_{ik} / \sqrt{\in X_{ik}^2 * \in M_{ik}^2}$$

Whereas:

Xik: The country's exports of commodity i and k indicate the target market.

Mik: The target market's imports of the commodity i.

4. RESULTS AND DISCUSSIONS

4.1 Global Production and Trade of Dates
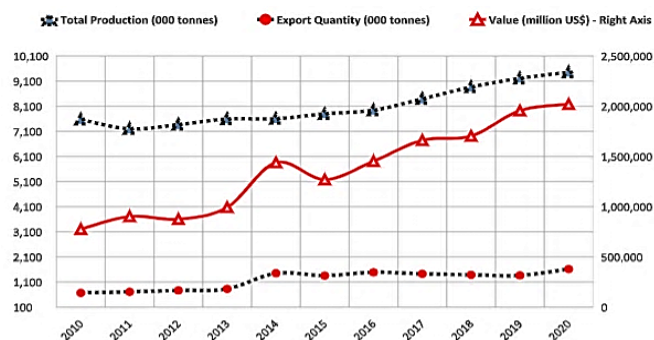
Figure 1: Evolution of indicators, quantity and value of global exports of dates during the period 2010- 2020 (Data source: FAOSTAT, Production, Crops http://www.fao.org/faostat/en/#data/QC)

Figure 1 presents the evolution of global total production during the period 2010- 2020. The average total production was 8090 thousand tonnes, the maximum total production was 9454 thousand tonnes in 2020, while the minimum total production was 7197 thousand tonnes in 2011 (Figure 1). The world export of dates has reached a maximum of US$ 2 billion in 2020 with an average US$ 1.3 billion during the period 2010-2020. Average world export price reached US$ 1161 during the 2010-

2020, but there are fluctuations in the export prices which dropped in 2014 till 2016 and started increasing to reach the maximum in 2019. Egypt is the world leader in date production and cultivation. Total production in 2020 was approximately 1.7 million tonnes of dates. This represents about 18 percent of global date production but only 3 percent of the world exports (Figure 2).

Egypt has increased date cultivation by more than 100 percent since 1993. Saudi Arabia came second after Egypt with 1.5 million tonnes annually. This represents about 16.3 percent of global date's production in 2020. Despite this large production rate, it only accounts for approximately 7.7 percent of total world exports. The third largest producer of dates is the Islamic Republic of Iran with 1.3 million tonnes representing about 14 percent of global date's production in 2020. The date palm exports from Iran turned out to be greater than Egypt although still relatively small for total world exports. Iran exports about 10 percent of the total dates produced to various countries. Most countries that import dates from Iran are countries in Asia. The biggest importing dates from Iran are India at 19 percent and Malaysia around 13 percent. Russia also apparently imported dates from Iran by 10 percent. Algeria, Iraq and Pakistan came fourth, fifth and sixth places respectively with 12, 7.8 and 5.6 percent of global date's production in 2020 (Figure 2).
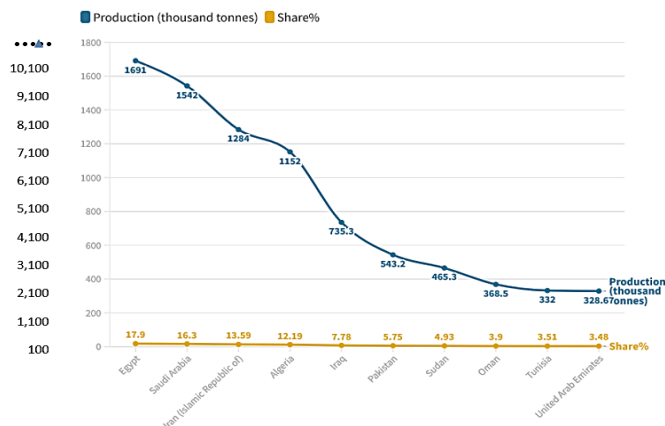
Figure 2: Top ten dates producing countries of the world, 2020 (Data source: FAOSTAT, Production, Cropshttp://www.fao.org/faostat/en/#data/QC)

4.2 Trend for Exported Egyptian Dates

The data in Figure 3 indicated that Egypt's exports quantity of dates during the period 2010-2021 ranged between a minimum of about 11.28 thousand tonnes in 2012, and a maximum of about 50,776 thousand tonnes in 2018, while its average during that period was about 33.231 thousand tonnes. By studying the trend evolution of the export quantity of Egypt's dates through Table 1, the results show that the annual change was 2.67 thousand tonnes and a rate of change of about 8.0 percent, statistically significant. The data in Figure 3 exhibited that the average value of Egypt's exports of dates during the period (2010-2021) amounted to about US$37.68 million and ranged between a minimum of about US$22.76 million in 2010, and a maximum of about US$50.01 million in 2018. By studying the trend of the value of Egypt's exports of dates during the study period, the results in Table 1 showed that it increased by a statistically significant annual amount of about US$19.8 million and an annual change rate of about 5.2 percent.
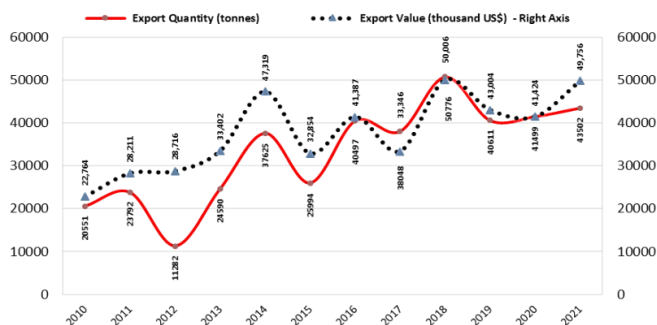

Figure 3: Exports quantity and value of Egyptian dates during the period (2010-2021) (Data source:1- https://www.trademap.org; 2- Central Administration of Plant Quarantine, MALR, Egypt)

Table 1: Results of The Trend for Quantity and Value of Egypt's Exports of Dates During the Period 2010-2021				
Statement	**Equation**	**R²**	**F$_{test}$**	**Rate of change (%)**
Export Quantity (tonne)	$\widehat{Y}_i = 15.87 + 2.67\ X_i$ (3.76) (4.66)	0.68	21.69	8.0
Export value (000 US$)	$\widehat{Y}_i = 24.83 + 19.8\ X_i$ (6.91) (4.05)	0.62	16.41	5.2

P-value: expresses the results of the hypothesis test as a significant level.

P-values smaller than 0.05 are taken as evidence that the population coefficient is nonzero.

Data source: Calculated by the author.

4.3 Competitiveness of Egypt's Exports for Dates and The Impact of The Future Production of The 2.5 Million Date Palm Programme

This section deals with the study of the most important indicators of the competitiveness of the Egyptian dates in global markets in the current situation, as well as shed the light on the future impact of the production of 2.5 million palm trees.

The most important indicators, measures of competitiveness and methods of estimating them will be clarified as follows:

4.3.1 International Market Share Index

By extrapolating the share of Egypt's exports of dates from the global market during the period (2017-2021), the average of Egyptian market share was 2.54 percent of the total global market share of dates during the study period, and the market share of Egypt ranged between a maximum of about 2.87 percent in 2018 and a minimum of about 2.28 percent in 2021 (Table 2).

4.3.1.1 The Impact of The Future Production of the 2.5 Million Date Palm Programme on Egypt's Market Share in the Global Market

It should be noted that the project started in 2019 and was completed in the following three years (2020-2022), and then it can be hypothesized that it will give full production by 2030.

The presidential initiative is meant to open new date export markets, establish logistics areas by increasing the number of refrigerated trucks, expand the cultivation of luxurious varieties with good economic returns and high quality in addition to building cold and freezing warehouses where dates are harvested.

Three scenarios were used and the Egyptian dates export along with Egypt's market share was predicted for the period 2030- 2034 under different scenarios.

4.3.1.1.1 Scenario A, Egypt's Exports Continuing at the Same Rates

The expected amount of Egypt's exports of dates, as well as the expected amount of world imports of dates during the period (2022-2034), was estimated based on "average exports of Egypt, average imports of the world, average annual growth of world imports, and the market share of Egypt's exports in the actual period (2017-2021). The results showed that the amount of Egypt's exports is expected to increase from about 44.122 thousand tonnes in 2022 to reach about 58.942 thousand tonnes in 2034, with an average of about 51.532 thousand tonnes, while the quantity imports of world is expected to reach about 1.84 million tonnes in 2022 and then increase to reach about 3.62 million tonnes in 2034, with an expected average for that period of about 2.73 million tonnes (Table 2). However, it was found that the expected market share of Egypt in the world's total imports decreased from about 2.40 percent in 2022 to reach about 1.63 percent in 2034, with an average of about 1.93 percent for that period.

4.3.1.1.2 Scenario B, Hundred Percent of the Total Production of the 2.5 Million Date Palm Programme for Exports

Assuming that Egypt will direct hundred percent of the production of the 2.5 million date palm program to the global market. The expected amount of Egypt's exports of dates, as well as the expected amount of world imports of dates during the period (2022-2034), were calculated based on "average exports of Egypt, average imports of the world, average annual growth of the world imports and the market share of Egypt's exports in the actual period 2017- 2021. By estimating the amount of Egypt's projected exports of dates, it was found that it is projected to reach about 339.89 thousand tonnes in 2030 and increase to about 344.83 thousand tonnes in 2034 and is projected to average of 342.36 thousand tonnes over

2030- 2034. The world's imports of dates are projected to reach about 3.02 million tonnes in 2030 and increase to reach about 3.62 million tonnes in 2034. By estimating the projected market share of Egypt's exports of dates from the total world market in case Egypt directs 100 percent of the production of the 2.5 million date palm program to the global market, the data in table 5 shows that the Egyptian market share was 11.23 percent in 2030 and about 9.53 percent in 2034, with an average of about 10.34 percent of the total global market of dates.

4.3.1.1.3 Scenario C, Fifty Percent of The Total Production of the 2.5 Million Date Palm Programme for Exports

Assuming that Egypt will direct only 50 percent of the total production of the 2.5 million date palm programme to the global market. Data in Table 2 shows that the projected Egyptian share of export dates is 6.51 percent in 2030 and about 5.58 percent in 2034 with an expected average of about 6.02 percent of the total global market of date.

Table 2: Market Share Index of Egypt's Exports of Dates in The Global Market During the Period (2017-2021), and The Impact of The 2.5 Million Palm Tree Production Program on The Market Share of Egypt														
Years	2017	2018	2019	2020	2021	Average								
Egypt exports (tonnes)	38048	50776	40611	41499	43502	42887								
world imports (tonnes)	1410307	1767218	1618540	1755693	1911212.9	1692594								
Egypt's share of the international market	**2.70**	**2.87**	2.51	**2.36**	**2.28**	**2.54**								
The growth rate in the quantity of world imports	9.53	25.31	-8.41	8.47	8.86	8.73								
Years	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Average
Egypt exports (tonnes)	44122	45357	46592	47827	49062	50297	51532	52767	54002	55237	56472	57707	58942	51532
World imports (tonnes)	1840728	1988861	2136995	2285129	2433262	2581396	2729529	2877663	3025797	3173930	3322064	3470198	3618331	2729529
Egypt's share of the international market	**2.40**	**2.28**	**2.18**	**2.09**	**2.02**	**1.95**	**1.89**	**1.83**	**1.78**	**1.74**	**1.70**	**1.66**	**1.63**	**1.93**

Years							2030		2031	2032	2033	2034		Average
Egypt exports (tonnes)	1- Scenario of exporting 100% of the total production of 2.5 million palm trees						339894		341129	342364	343599	344834		342364
World imports (tonnes)							3025797		3173930	3322064	3470198	3618331		3322064
Egypt's share of the international market							**11.23**		**10.75**	**10.31**	**9.90**	**9.53**		**10.34**
Years							2030		2031	2032	2033	2034		Average
Egypt exports (tonnes)	2- Scenario of exporting 50% of the total production of 2.5 million palm trees						196948		198183	199418	200653	201888		199418
World imports (tonnes)							3025797		3173930	3322064	3470198	3618331		3322064
Egypt's share of the international market							**6.51**		**6.24**	**6.00**	**5.78**	**5.58**		**6.02**

4.3.2 Market Share of Egyptian Date Exports in the Most Important Importing Countries Market

The market share of Egypt was studied in the four main markets (Morocco, Indonesia, Malaysia and Bangladesh), where those four markets accounted for about 85 percent of the average of Egypt's total exports of dates during the period 2010-2021. Table 3 shows that the average market share of Egyptian dates exports during 2010-2021 reached its highest levels in the Indonesian market, where the average market share of Egypt's exports in the Indonesian market reached 36.6 percent, and ranged between a minimum in 2013 with 22.5 percent, and its highest level was about 49.1 percent in 2018. Morocco market came second in terms of the highest market share for Egyptian date exports, with an average about 18.7 percent over 2010- 2021, and the market share ranged between a minimum of about 13.1 percent in 2010, and a maximum of about 31.4 percent in 2016 (Table 3).

4.3.2.1 The Impact of The Expected Production of The 2.5 Million Date Palm Programme on The Market Share of Egypt's Exports of Dates

Two scenarios were used to calculate the Egyptian market share for the period 2030- 2034. First scenario depends on natural rates of Egyptian date exports to Morocco, Indonesia and Malaysia without the 2.5 million palms programme (business as usual scenario). Second scenario assumed that 50 percent of the total production of the 2.5 million date palm programme direct to Morocco, Indonesia and Malaysia markets.

4.3.2.1.1 Scenario A, Market Share of Egypt in the Morocco, Indonesia and Malaysia Markets, Without The 2.5 Million Palm Programme

The result in Table 4 shows that the projected markets share of Egypt in Morocco, Indonesia and Malaysia markets. During 2030- 2034, market share is projected to reach 39.3 percent in the Indonesian market, followed by about 33.1 percent in the Moroccan market. On the other hand, the projected market share of Egypt's exports of dates in the Malaysian market decreased to about 13.9 percent during 2030- 2034, compared to about 17.1 percent as an average during the period 2010-2021shown in Table 3.

4.3.2.1.2 Scenario B, 50 Percent of The Total Production of the 2.5 Million Date Palm Programme Direct to International Markets.

50 percent of the total production of the 2.5 program million palm trees direct to new and traditional markets. Scenario B assumed that Egypt has directed 25 percent of the total production of the 2.5 program million palm trees export to a new market which is a major goal of the 2.5 million palm trees programme. In addition to that, 25 percent of the total production of the 2.5 million palm trees programmed export to traditional markets (Morocco, Indonesia and Malaysia markets). During 2030- 2034, market share is projected to reach 45.3 percent in the Moroccan market, followed by 39.3 percent in the Indonesian market and 13.9 percent in the Malaysian market (Table 5).

Table 3: Market Share of Egypt's Dates Exports in The Largest Markets During the Period 2010-2021													
Items / year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	**2021**	Ave.
Imports to Morocco from the world (tonnes)	51449	40127	58401	47374	61834	69500	69324	70055	97436	98871	76161	113161	71141
Egyptian exports to Morocco (tonnes)	6739	6908	7694	8310	17647	14078	21777	12249	20641	14282	11944	15779	13171
Market share (%)	**13.1**	**17.2**	**13.2**	**17.5**	**28.5**	**20.3**	**31.4**	**17.5**	**21.2**	**14.4**	**15.7**	**13.9**	**18.7**
Imports to Indonesia from the world (tonnes)	16986	20142	22558	29111	30531	21053	23229	34620	39909	36169	52447	50134	31407
Egyptian exports to Indonesia(tonnes)	5745	6471	8567	6557	10804	7149	8045	14000	19593	16063	18800	19326	11760
Market share (%)	**33.8**	**32.1**	**38.0**	**22.5**	**35.4**	**34.0**	**34.6**	**40.4**	**49.1**	**44.4**	**35.8**	**38.5**	**36.6**
Imports to Malaysia from the world (tonnes)	17980	16236	20394	19421	21620	18869	18271	26251	19156	18006	22416	26191	20401
Egyptian exports to Malaysia(tonnes)	4612	4350	5089	3947	5713	2301	2692	2615	2447	2189	2177	2635	3397
Market share (%)	**25.7**	**26.8**	**25.0**	**20.3**	**26.4**	**12.2**	**14.7**	**10.0**	**12.8**	**12.2**	**9.7**	**10.1**	**17.1**
Imports to Bangladesh from the world (tonnes)	33614	34865	37138	20871	20871	28192	20723	18284	15845	13406	10967	8528	21942
Egyptian exports to Bangladesh(tonnes)	156	46	33	346	98	248	369	1070	889	3606	1567	1042	789
Market share (%)	**0.5**	**0.1**	**0.1**	**1.7**	**0.5**	**0.9**	**1.8**	**5.9**	**5.6**	**26.9**	**14.3**	**12.2**	**5.9**

Source : https://www.trademap.org

Table 4: Projected Market Share of Egypt Dates Exports in The Largest Markets During the Period 2030 -2034						
Items / year	**2030**	**2031**	**2032**	**2033**	**2034**	**Average**
Projected imports to Morocco from the world (tonnes)	129898	136296	142694	149092	155490	142694
Projected Egyptian exports to Morocco (tonnes)	41416	44348	47279	50211	53143	47279
Expected market share (%)	**31.9**	**32.5**	**33.1**	**33.7**	**34.2**	**33.1**
Projected imports to Indonesia from the world (tonnes)	62599	65999	69399	72799	76199	69399
Projected Egyptian exports to Indonesia (tonnes)	24371	25840	27310	28780	30250	27310
Expected market share (%)	**38.9**	**39.2**	**39.4**	**39.5**	**39.7**	**39.3**
Projected imports to Malaysia from the world (tonnes)	31306	32483	33660	34837	36014	33660
Projected Egyptian exports to Malaysia (tonnes)	4466	4564	4663	4761	4859	4663
Expected market share (%)	**14.3**	**14.1**	**13.9**	**13.7**	**13.5**	**13.9**

Bangladesh market was excluded due to the illogicality of its rates

Source: https://www.trademap.org**.**

Table 5: Projected Market Share of Egypt Dates Exports in the Largest Markets During the Period 2030 -2034						
25 percent of the total production of the 2.5 million date palm programme to the largest markets						
year	**2030**	**2031**	**2032**	**2033**	**2034**	**Average**
Projected imports to Morocco from the world (tonnes)	129898	136296	142694	149092	155490	142694
Projected Egyptian exports to Morocco (tonnes)	58740	61672	64603	67535	70467	47279
Expected market share (%)	**45.2**	**45.2**	**45.3**	**45.3**	**45.3**	**45.3**
Projected imports to Indonesia from the world (tonnes)	62599	65999	69399	72799	76199	69399
Projected Egyptian exports to Indonesia (tonnes)	35231	36700	38170	39640	41110	27310
Expected market share (%)	**38.9**	**39.2**	**39.4**	**39.5**	**39.7**	**39.3**
Projected imports to Malaysia from the world (tonnes)	31306	32483	33660	34837	36014	33660
Projected Egyptian exports to Malaysia (tonnes)	6482	6580	6679	6777	6875	6679
Expected market share (%)	**14.3**	**14.1**	**13.9**	**13.7**	**13.5**	**13.9**

Source: https://www.trademap.org**.**

4.3.3 Revealed Comparative Advantage (RCA)

The results reported in Figure 4 show the relative value of the revealed comparative advantage indices of Egypt's export of dates during the period (2010-2021), it was found that RCA ranged minimum of 1.0 in 2010, and maximum about 15.3 in 2016, with an average of about 7.3 over 2010- 2021. The results reveal that Egypt has a significant comparative advantage for export dates to the international markets, which confirms the availability of the apparent comparative advantage of Egyptian dates, due to the increase in the value of the RCA, (RCA≥ 1) during the period, except year 2010 (Figure 4).

Hillman (1980) suggested that the revealed comparative advantage index can also be used to measure dynamic competitiveness and comparative advantage of a country relative to the rest of the world if we assume that the elasticity of the revealed comparative advantage with respect to a

particular export change is positive. According to Porter Comparative advantages depend on the state's natural and human resources, a suitable climate and a distinct geographical location etc., while competitive advantages depend on finding new ways to produce goods and services with unique, distinct and innovative characteristics, with high quality and high added value (Porter, 1990).

Achieving competitive advantage by Egyptian state is increasingly being paid attention to by modern and integrated national projects such as 2.5 million palm tree programme, by using high quality varieties with international standards, developing enough number of packing stations in the production areas and by product industries establishment of factories to manufacture dates.
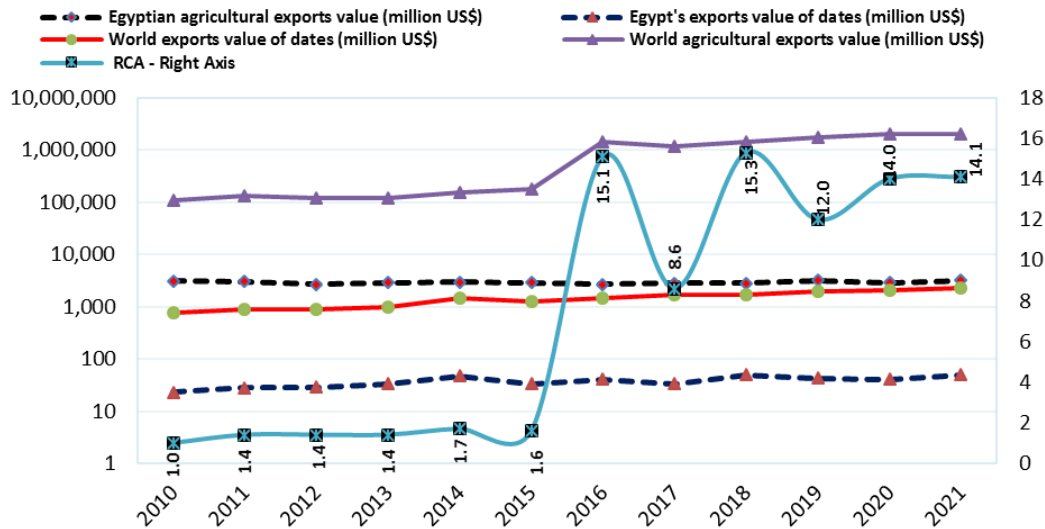

Figure 4: Revealed comparative advantage results during 2010-2021 (Data source: 1-CAPMAS; 2- https://www.trademap.org; 3-https://www.fao.org/faostat/ar/#data/QCL**)**

4.3.4 Export Instability Coefficient

The results of instability coefficient for Egyptian exported date are shown in Figure 5. The results show there is relative stability in both the quantity and value of Egyptian date exports**.**

The instability coefficient for the exported quantity of dates reached a maximum of 0.53 in 2012, and a minimum of 0.02 in 2017, with an average of 0.17. Furthermore, instability coefficient for Egyptian exported value of dates during the 2010-2021 presented in Figure 5. The instability coefficient for the exported value of dates reached a minimum of 0.02 in 2011, and a maximum of 0.36 in 2014, with an average of 0.11**.**
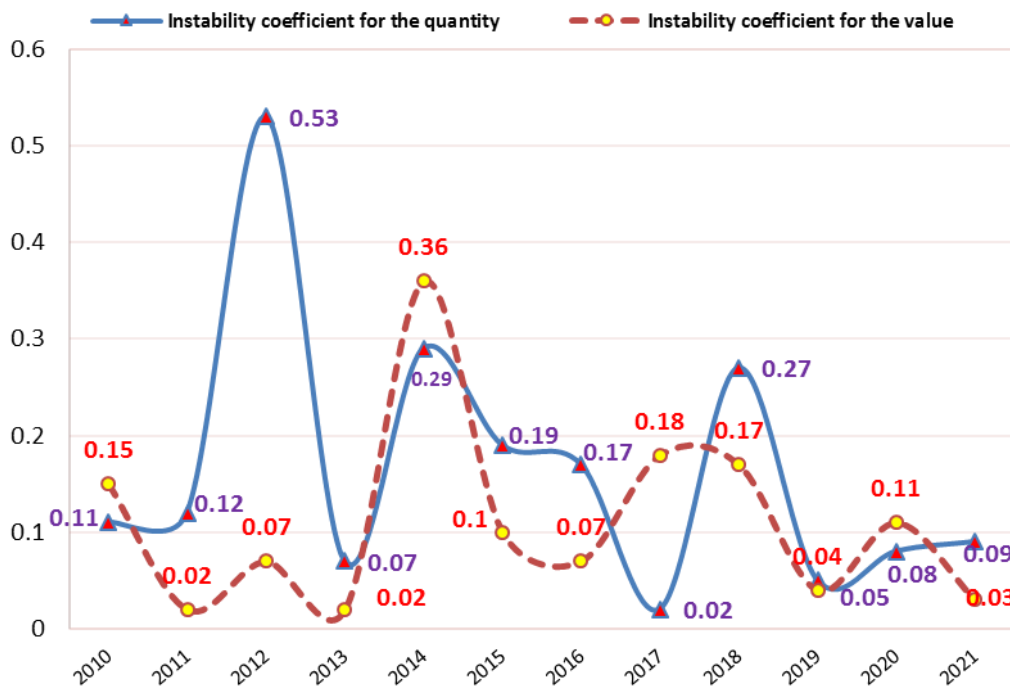

Figure 5: Quantity and values of instability coefficient for Egyptian exported dates during the period 2010-2021
(Data source: https://www.trademap.org.)

4.3.5 Index of Export Market Penetration for Egyptian Dates into International Markets

The market penetration index of Egyptian date for its major importing markets (Morocco, Indonesia, Malaysia and Bangladesh) presented in Table 6. The estimated results during 2010- 2021 reveal that the market penetration index reached the highest in the Indonesian market, where

the average coefficient reached about 36.59 percent, followed by Malaysia, Morocco and Bangladesh (20.78 percent, 7.03 percent and 5.86 percent respectively).The previous results indicate that the penetration coefficient of Egyptian dates differs between four markets, so markets with high penetration coefficient reflect the possibility of increasing Egyptian date's exports if the appropriate effort is made to study those markets and identify their needs.

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Aver.
Table 6: Market Penetration Index for Egyptian Dates During the Period 2010 -2021													
Morocco imports from world (tonnes)	51449	40127	58401	47374	61834	69500	69324	70055	97436	98871	76161	113161	71141
Morocco exports (tonnes)	11	18	14	216	170	761	427	178	222	1054	3594	1882	712
Morocco production (tonnes)	101351	102961	101862	111924	102201	100376	125329	129562	111701	101537	143160	149147.5	115093
Morocco imports from Egypt (tonnes)	6739	6908	7694	8310	17647	14078	21777	12249	20641	14282	11944	15779	13171
Market penetration rate(%)	**4.41**	**4.83**	**4.80**	**5.22**	**10.77**	**8.32**	**11.21**	**6.14**	**9.88**	**7.16**	**5.54**	**6.06**	7.03
Indonesia imports from world (tonnes)	16986	20142	22558	29111	30531	21053	23229	34620	39909	36169	52447	50134	31407
Indonesia exports (tonnes)	59	1	3	45	2	7	0	2	1	9	87	52	22
Indonesia production (tonnes)	0	0	0	0	0	0	0	0	0	0	0	0	0
Indonesia imports from Egypt (tonnes)	5745	6471	8567	6557	10804	7149	8045	14000	19593	16063	18800	19326	11760
Market penetration rate(%)	**33.94**	**32.13**	**37.98**	**22.56**	**35.39**	**33.97**	**34.63**	**40.44**	**49.10**	**44.42**	**35.91**	**38.59**	36.59
Malaysia imports from world (tonnes)	17980	16236	20394	19421	21620	18869	18271	26251	19156	18006	22416	26191	20401
Malaysia exports (tonnes)	4268	3914	2430	1654	4036	2725	3360	3500	2912	2749	4127	4718	3366
Malaysia production (tonnes)	0	0	0	0	0	0	0	0	0	0	0		0
Malaysia imports from Egypt (tonnes)	4612	4350	5089	3947	5713	2301	2692	2615	2447	2189	2177	2635	3397
Market penetration rate(%)	**33.63**	**35.30**	**28.33**	**22.22**	**32.49**	**14.25**	**18.05**	**11.49**	**15.06**	**14.35**	**11.91**	**12.27**	20.78
Bangladesh imports from world (tonnes)	33614	34865	37138	20871	20871	28192	20723	18284	15845	13406	10967	8528	21942
Bangladesh exports (tonnes)	330	0	0	0	0	0	0	0	0	0	0	0	28
Bangladesh production (tonnes)	0	0	0	0	0	0	0	0	0	0	0	0	0
Bangladesh imports from Egypt (tonnes)	156	46	33	346	98	248	369	1070	889	3606	1567	1042	789
Market penetration rate(%)	**0.47**	**0.13**	**0.09**	**1.66**	**0.47**	**0.88**	**1.78**	**5.85**	**5.61**	**26.90**	**14.28**	**12.21**	5.86

Source:

1- https://www.trademap.org.

2- https://www.fao.org/faostat/ar/#data/QCL.

4.3.6 The Import–Export Correspondence Index "Cosine"

As present in Figure 6, the correspondence index of the Egyptian dates export to Indonesia, Morocco, and Malaysia are better than Bangladesh.

The estimation results are displayed in Figure 6, overall, it emerges that the correspondence index reaching about 0.98, 0.96, 0.92, respectively to Indonesia, Morocco, and Malaysia. On the other hand, the value of the index in Bangladesh was only 0.39.
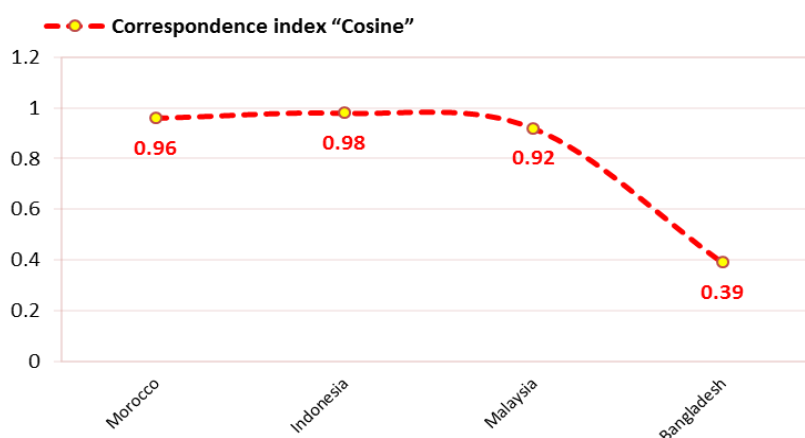

Figure 6: Correspondence index of Egypt's dates exports to the largest markets during the period 2010-2021 (Data source: https://www.trademap.org)

5. CONCLUSION

Date industry in Egypt is not yet fully developed; more effort is still needed to flourish this industry. This study illustrates the need to adopt a pluridimensional policy approach in the Egyptian date sector in order to make trade a proper instrument for agricultural development in new national projects in Egypt. Despite the fact that Egypt is the world leader in date production, however, it imports dates from abroad. The quantity of the Egyptian date imports was 13 thousand tonnes with value about $10 million, so this project is a good tool to increase the high quality dates and to avoid an increase of imported dates from main competitors and also covers the future demands due to the population growth in addition to the increase in the competitiveness indices. Furthermore, this paper is an attempt to examine the role of the 2.5 million palms programme

production in the global market, the Egyptian dates will increase in all destination markets from 2022 to 2034 and achieving the desired economic and social development.

REFERENCES

Balassa, B., 1965. Trade Liberalization and Revealed Comparative Advantage. Manchester School of Economic and Social Studies, 33 (2), Pp. 99–123.

Beers, C.P., and Linnemann, H., 1988. Commodity composition of trade in manufactures, and south-south trade potential. (Research memoranda; No. 1988-6). Faculty of Economics and Business Administration, VrijeUniversiteit Amsterdam.

Brenton, P., and Richard, N., 2007. Watching More Than the Discovery Channel: Export Cycles and Diversification in Development', Policy Research Working Paper, WorldBank

Central Administration of Plant Quarantine, Ministry of Agriculture and Land Reclamation, Egypt, 2021.

Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt, 2022.

Egypt presidency, 2018. Presidential initiative for 2.5 million date palms, 2018.

El-Sharabasy, S., and Rizk, R., 2019. Atlas of date palm in Egypt. Egypt. FAO.

FAO. 2018. Statistics. United Nations: Food and Agriculture Organization.

FAOSTAT, 2022. Crop Production 2020, Statistics Division, Food and Agriculture Organization of the United Nations.

Hillman, A.L., 1980. Observations on the Relation between 'Revealed Comparative Advantage' and Comparative Advantage as Indicated by Pre-trade Relative Prices. Weltwirtschaftliches Archiv, 116, Pp. 315-321.

Knudsen, O., and Parnes, A., 1975. Trade Instability and Economic Development. D. C. Health and Co, London.

Linnemann, H., and van Beers, C.P., 1987. 'Measures of export-import similarity, and the Linder hypothesis once again'. Research Memorandum 1987-30. Amsterdam, Faculty of Economics, Free University.

Ministry of Agriculture and Land Reclamation, Economic Affair Sector, 2021.

Paul, W.F., Neil, T.B., Phillip, E.P., David, J.R,. 2008. Marketing Metrics: 50+ Metrics Every Executive Should Master", Pearson Education, Inc, Publishing as Prentice Hall Upper Saddle River, New Jersey.

Porter, M.E., 1990. The Competitive Advantage of Nations; Free Press: New York, NY, USA.

United Nations. 2007. United Nation Corntrade Online Database, online service, website: http://www.uncomtrade.org