



## THE IMPACT OF CONTEMPORARY EGYPTIAN CHANGES ON THE MOST IMPORTANT ECONOMIC VARIABLES OF SOME MEDICINAL PLANTS

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### Abstract

The research aimed to identify effects of the January 25 revolution, on some economic variables for some medicinal and aromatic plants as most important export commodities of in recent years. And find out most influential factors on each of total production and kidney revenue investigator for farmer. To achieve aim of the research was divided study period (2001-2015) to three periods represented in base period (2001-2005) and two periods are compared (2006-2010), (2011-2015). It was found from results of study that decline in cultivated area of cumin and coriander during period (2006-2010) by about 42.1%, 13.5% led to a decline estimated rate of about 136%, 368% of decline volume in overall production for them during that period, which was estimated at 991, 403 tons, respectively, while increasing anise area increased by 73.8% to increase total output about 73%, and acre productivity increased by about 19.1%, 15.5%, 11.3% led to an increase estimated approximately 62%, 15%, 310% of amount of increase in total production from cumin, anise and coriander. The remainder ratio of increase in overall production of previous crops during same period, is due to combined effect of both area and acre productivity. While decline in cultivated area of cumin and coriander during period (2011-2015) by about 63.6%, 60.3% resulted in lower estimated rate of about 112%, 103% of size of decline in overall production of previous crops during that period, which was estimated at 1812, 6439 tons, respectively. While increase anise area by 6.1% led to increase kidneys production by 17%, while increasing acre productivity by about 18.9%, 28%, 4.8% resulted in an increase of 33%, 78%, 8% of size of increase in total production of cumin, anise and coriander during same period, and remaining returns increase in total production to combined effect of area and productivity. The results also showed that increase in average acre productivity of cumin, anise, coriander 19.1%, 15.5%, 11.3% led to increased kidney revenue by 30.4%, 22.6%, 16.4%, respectively of total increase generated in kidney revenue during first comparison period. While it resulted in increase farm price by about 36.8%, 46%, 52% to increase kidney revenue 58.5%, 67.1%, 75.1% of total increase in kidney revenue in first comparative period, amounting to 3094, 2783, 2298 pounds/acre of previous crops, respectively. And returns remaining increase in kidney revenue to combined effect of both acre production and farm price (11.1%, 10.3%, 8.5%). The results show that increase in average acre productivity by about 18.9%, 28%, 4.8% each of cumin, anise and coriander has led to increased kidney revenue same as previous crops by 20.2%, 17.2%, 6.4% respectively of total increase incident in kidney revenue through second comparison period. This has been increase in farm price at about 62.7%, 105%, 67.3% and increase kidney revenue by 67.1%, 64.7%, 89.3% of total increase incident in kidney revenue during second comparison period, amounting to about 4595, 6608, 2503 pounds/feddan same as previous crops, respectively, during second comparison period. And is due to remaining increase in kidney revenue to combined effect of both acre production and farm price (12.7%, 18.1%, 4.3%). The results indicate to positive impact of the January 25 revolution on income of producers of cumin, anise, while effect was negative impact for coriander. The increase incomes of producers due to increase prices significantly, especially in light of failure to dependence cultivation medicinal and aromatic plants on use of high cost chemicals.

**Keywords:** Medicinal and Aromatic Crops, January 25 Revolution, agricultural policies, Economic Variables.

### Introduction

Agricultural production is affected by success of agricultural policies followed by the country, under application of economic reform policies and freedom to make farm's decisions production and marketing in light of supply and demand mechanisms and undergo agricultural crops to conditions of free trade, government must intervene by applying some of directed policies either to impose taxes or subsidies production requirements or declaration ensuring prices closer to world prices to guide farmers towards expansion of cultivation of strategic crops or yield exporting which reduces deficit in trade balance. The circumstances of Egypt since the twenty-fifth of January 2011 which led to deterioration of cultivated area of medicinal and aromatic plants decreased as cumin and coriander area from about 7.04, 10.3 thousand acres in 2001 to about 1.6, 3.7 thousand acres in 2015, respectively. Although that Egypt enjoyed a comparative advantage in production of those plants- which affects on exports of those plants. The research problem: Although the state to adopt policies in agricultural sector aimed at achieving high rates of economic and social development by increasing production of various agricultural crops, especially export crops to reduce deficit in trade balance and provide foreign currency needed to achieve development, but presence of some negative effects resulting

from some of decisions taken after revolution of January 25, 2011 and showed rising prices of production input, wages rise and fall of prices for many crop have resulted in reluctance of producers for cultivation of some medicinal and aromatic plants, especially with decline in Egyptian exports to them after the revolution.

**Aim of the research:** research aimed to identify effects of the January 25 revolution of some economic variables for some medicinal and aromatic plants as most important export commodities lately. And find out most influential factors on each of total production and kidney revenue investigator for farmer.

### Research method and data sources

To achieve aim of the research was divided time period (2001-2015) into three periods: base period (2001-2005), a period prior to application of GATT, first comparison period (2006-2010) which is application of GATT period, second comparison period (2011-2015) and a period following the revolution of January 25, 2011. This research has relied on secondary data published and unpublished, which was obtained from Ministry of Agriculture and Land reclamation and Central Agency for public mobilization and Statistics. As well as use of statistical methods that are consistent with objectives of the research as focused in descriptive analysis

of data and use of standard numbers in various forms to measure variables of study and isolate effect of various factors affecting them, using following equations:-

The separate effect of component (A) on phenomenon @ IA = (AiMo- AoMo)

The separate effect of component (M) on phenomenon @ IM = (AoMi - AoMo)

The general separate effect on change phenomenon @ IR = IA+IM

The combined effect of component (A) with component (M) (AiMi – AoMi) - ( AiMo – AoMo )

General sequential influence on change phenomenon IR = IA + IM + (AiMi-AoMi) -(AiMo-AoMo)

Whereas:

Ao = the area cultivated acre of crop in base period

Mo = average production in tons per acre of crop in base period

Ai =area cultivated acre of crop in period of comparison.

Mi =average production in tons per acre of crop in period of comparison.

In addition to use of some economic efficiency metrics such as net return of acre, unit cost and rate of return to costs

## Results

### First: impact of the revolution January 25 on total output of most important medicinal and aromatic plants and its changes:

The use of standard numbers as an analytical tool for measuring changes in kidney output resulting from policies followed during study period, and also measure amount of impact factors (elements of phenomenon) affecting overall production, which is represented in cultivated area and average productivity per acre, in two terms of comparison (2006-2010 ), (2011-2015) for base period (2001-2005). Table (1) shows results of analysis and measurement:

**Compared first period (2006-2010) to basis period (2001-2005):** Table (1) shows reduced total output of cumin and coriander in first comparison period (2006-2010) than in base period (2001-2005), where estimated decline rates of approximately 31.1%, 3.7% respectively, while increasing total output of anise estimated 100.7%. By studying separate impact to lower area of cumin and coriander without acre productivity element show drop in aggregate output of them about 1344, 1484 tons respectively, while anise space increased by 73.8% led to increased kidney output by about 686 tons. By studying impact of acre productivity element impose stability cultivated area element, increasing acre productivity led to increased total output of cumin, anise and coriander about 610, 144, 1249 tons respectively, during first comparison period. Emerging increase impact of change in cultivated area and acre productivity (combined effect) it has been estimated at about -257, 106, -168 tons for medicinal plants mentioned respectively. This is when determining relative importance for effect of each of cultivated area and

acre productivity on kidneys production to study crops, shows that decline in cultivated area of cumin and coriander at about 42.1%, 13.5%, respectively, led to a decline of 136%, 368% of volume decline in overall production of two crops during first comparison period, which was estimated at 991,403 tons, respectively, while increasing anise space increased by 73.8% led to increased total output about 73%. At same time, increase acre productivity 19.1%, 15.5%, 11.3% led to an increase of 62%, 15%, 310% of size of increase in total production of cumin, anise and coriander during same period. This is because remaining increase in overall production to combined effect of both space and productivity (26%, 12%, 42%)

**Compared to second period (2011-2015) and base period (2001-2005):** Table (1) shows reduced total output of cumin and coriander in second comparison period (2011-2015) than in base period (2001-2005), where rates of decline were estimated at 56.8%, 58.4%, respectively, while increasing kidney output of anise by about 35.7%. By studying separate effect of lower area of cumin and coriander without acre productivity element show reduced total output by about 2031, 6651 tons respectively, while increasing anise area by 73.8% led to increased kidneys output at about 56 tons. And study impact of acre productivity element impose constant cultivated area element, the increase acre productivity led to increased total output of cumin, anise, coriander about 603, 260, 534 tons, respectively, during second comparison period. Emerging increase impact of change in cultivated area and acre productivity (combined effect) has been estimated at -384, 16, -322 tons for each of medicinal plants mentioned respectively. When determining relative importance of effect cultivated area and acre productivity on overall production of study crops, Show that decline in cultivated area of cumin and coriander at about 63.6%, 60.3%, respectively, led to a decline of 112%, 103% of size of decline in overall production for them during second comparison period, which was estimated at 1812, 6439 tons, respectively, while increase anise area by 6.1% resulted in increased total output from it by about 17%. At same time, increase acre productivity by about 18.9%, 28%, 4.8% resulted in an increase of 33%, 78%, 8% of size of increase in total production of cumin, anise and coriander during same period. This is because remaining increase in overall production to combined effect of both area and productivity (21%, 5%, 5%)

### Second: Impact of the revolution on January 25 on kidneys return of some medicinal and aromatic plants, incident changes and its determinants:

The use of standard numbers as an analytical tool for measuring arising changes in kidney revenue from policies followed during study period, and also measure amount of impact factors (elements of phenomenon) affecting on kidney revenue, which is represented in farm prices and average of productivity per acre, in two comparison periods first and second for base period . Table (2) shows results of analysis and measurement.

**First comparative period compared to base period:** Table (2) shows increased kidney revenue of cumin, anise, and coriander during first comparison period (2006-2010) than in base period (2001-2005), where increase was estimated at 62.9%, 68.5%, 69.2%, respectively. By studying separate effect of increasing acre productivity without impact of farm price component, it led to an increase in kidney revenue of acre from mentioned crops about 939, 686, 376 pounds/acre, respectively, as for impact of farm price element impose stability productivity element, increase incident in farm price has increased kidney revenue by about 1809, 1867, 1726 pounds/acre previous crops, respectively. The incident increase in kidney revenue between separate and sequential impact, estimated at about 346, 289, 195 pounds/acre of previous crops, respectively, attributable to combined effect or interoperability of both acre production and price farm of crop.

By estimate relative importance for effect of both average acre production and price farm on kidney revenue for study crops, has found that total revenue has increased by about 3094, 2783, 2298 pounds/acre for each of cumin, anise, coriander, respectively, during first comparison period in base period (Table (2))

By studying specific weight for each of average acre productivity and farm prices shown to increase average acre productivity 19.1%, 15.5%, 11.3% for previous crops, respectively, it led to increased kidney revenue for those crops by 30.4%, 22.6%, 16.4%, respectively, of total increase generated in kidney revenues during first comparison period. While it resulted in farm price increase by about 36.8%, 46%, 52% to increase kidney revenue by about 58.5%, 67.1%, 75.1% of increase in total revenue in first comparative period, amounting to 3094, 2783, 2298 pounds/acre for previous crops, respectively. And returns remaining increase in kidney revenue to combined effect of both acre production and farm price (11.1%, 10.3%, 8.5%)

**Compared to second comparative period for base period:** Table (2) shows increased kidney revenue from cumin, anise, coriander during second comparison period (2011-2015) than in base period (2001-2005), where growth rate was estimated at 93.5%, 163%, 75.3%, respectively. By studying separate effect of increasing acre productivity without impact of farm price element shown to increase acre productivity each of cumin, anise, coriander led to increased kidney revenue for acre during second comparison period about 929, 1136, 161 pounds, respectively. The impact of farm price element impose stability of productivity element, the increase incident in farm price has led to increased kidney revenue per acre during second comparison period about 3083, 4276, 2234 pounds for each of cumin, anise, coriander, respectively. The increase incident in kidney revenue per acre between separate

and sequential effect which was estimated at 583, 1196, 108 pounds each of cumin, anise, coriander, respectively, attributable to effect combined or interoperability of both acre productivity and farm price of product. And estimate relative importance of effect of average acre productivity and farm price on kidney revenue each of cumin, anise, coriander has been shown that kidney revenue has increased by about 4595, 6608, 2503 pounds/acre each of cumin, anise, coriander, respectively, during second comparison period than in base period. By studying specific weight each of average productivity and farm price shown to increase average acre productivity by about 18.9%, 8%, 4.8% each of cumin, anise, coriander has led to increased kidney revenue same as previous crops by 20.2%, 17.2%, 6.4%, respectively of total incident increase in kidney revenue during second comparison period. This has been increase in price farm led by about 62.7%, 105%, 67.3% and increase kidney revenue per acre of cumin, anise, coriander increased by 67.1%, 64.7%, 89.3% of total increase incident in this kidney revenue during second comparison period, amounting to about 4595, 6608, 2503 pounds/acre for same previous crop, respectively, during second comparison period. And it returns remaining increase in kidney revenue to combined effect of both acre production and farm price (12.7%, 18.1%, 4.3%)

**Third: The impact of the January 25 revolution, on some of economic efficiency indicators for some medicinal and aromatic plants:** Table (3) shows that cost per ton of cumin, anise, coriander rose from about 3915, 2987, 1609 pounds per ton, respectively, during period (2001-2005) to about 4366, 3718, 2182 pounds per ton on average for period (2006-2010) to reach about 5697. 4583, 2995 pounds per ton on average for period (2011-2015), it refers to almost doubled from one period to another. It has increased net yield per acre for cumin, anise and coriander in current prices during both periods of comparison (2006-2010), (2011-2015) estimated 80.6%, 107% to match them during base period (2001-2005). By studying standard rate of return to costs show height for producers of cumin, anise during both periods of comparison for base period, it refers to positive impact of the revolution on January 25 on income for producers of former crops. On contrary, rate of return has dropped to costs for producers of coriander during second comparison period from those of base period. By studying standard ratio of cost per ton of farm price show decline during both periods of comparison for base period for two crops cumin, anise, and indicating that increase in product prices from increase in production costs. This may be due to lack of expansion in use of chemicals in production of medicinal plants, as well as focusing cultivate those plants in Fayoum Governorate, which is where rest of irrigation system and not rely on fuel to irrigate land

**Table 1 :** Relative changes and results of analysis impact of phenomenon elements on change in kidneys production for some medicinal plants during period 2001-2015. (Area: feddan, productivity and production: tons)

Crop	Elements of phenomenon	Average Of Study Periods					Absolute effect of changing elements phenomenon between base and first comparison periods			Specific weight of impact elements (relative importance)	Absolute effect of changing elements phenomenon between base and second comparison periods			Specific weight of impact elements (Relative importance)
		Base period (2001-2005)	First comparison period (2006-2010)	Second comparison period (2011-2015)	Standard number $1/2 \times 100$	Standard number $1/3 \times 100$	Discrete effect of element	Combined effect between (A), (M)	Sequential effect of element		Discrete effect of element	Combined effect between (A), (M)	Sequential effect of element	
cumin	Area (A)	6446	3731	2344	57.9	36.4	-1344	-	-1344	-136	-2031	-	-2031	-112
	Productivity (M)	0.495	0.590	0.589	119.1	118.9	610	-	610	62	603	-	603	33
	Production (R)	3192	2201	1380	68.9	43.2	-734	-257	-991	100	1428	-384	-1812	100
anise	Area (A)	1652	2872	1752	173.8	106.1	686	-	686	73	56	-	56	17
	Productivity (M)	0.562	0.649	0.720	115.5	128	144	-	144	15	260	-	260	78
	Production (R)	929	1865	1261	200.7	135.7	830	106	936	100	316	16	332	100
coriander	Area (A)	13049	11294	5180	86.5	39.7	-1484	-	-1484	-368	-6651	-	-6651	-103
	Productivity (M)	0.845	0.941	0.886	111.3	104.8	1249	-	1249	310	534	-	534	8
	Production (R)	11029	10626	4590	96.3	41.6	-235	-168	-403	100	-6117	-322	-6439	100

Source: collected and calculated by Ministry of Agriculture and Land Reclamation - Economic Affairs Sector - Central Administration of Agricultural Economics - Agricultural Economics Bulletin - different numbers for period 2001-2015

**Table 2 :** Relative changes and results of analysis impact of phenomenon elements on change in kidneys income of some medicinal plants during period 2001-2015. (productivity: tons, farm price: pound/ tons)

Crop	Elements of phenomenon	Average of study periods					Absolute effect of changing elements phenomenon between base and first comparison periods			specific weight of impact elements (relative importance)	Absolute effect of changing elements phenomenon between base and second comparison periods			Specific weight of impact elements (Relative importance)
		Base period (2001-2005)	First comparison period (2006-2010)	Second comparison period (2011-2015)	Standard number $1/2 \times 100$	Standard number $1/3 \times 100$	Discrete effect of element	Combined effect between (A), (M)	Sequential effect of element		Discrete effect of element	Combined effect between (A), (M)	Sequential effect of element	
cumin	Productivity (M)	0.495	0.590	0.589	119.1	118.9	939	-	939	30.4	929	-	929	20.2
	Farm price (P)	9926	13579	16151	136.8	162.7	1809	-	1809	58.5	3083	-	3083	67.1
	total Revenue (R)	4916	8010	9510	162.9	193.5	2748	346	3094	100	4012	583	4595	100
anise	Productivity (M)	0.562	0.649	0.720	115.5	128	686	-	686	22.6	1136	-	1136	17.2
	Farm price (P)	7224	10544	14829	146	205	1867	-	1867	67.1	4276	-	4276	64.7
	total Revenue (R)	4062	6845	10670	168.5	263	2495	289	2783	100	5412	1196	6608	100
coriander	Productivity (M)	0.845	0.941	0.886	111.3	104.8	376	-	376	16.4	161	-	161	6.4
	Farm price (P)	3930	5973	6574	152	167.3	1726	-	1726	75.1	2234	-	2234	89.3
	total Revenue (R)	3322	5620	5825	169.2	175.3	2102	195	2298	100	2395	108	2503	100

Source: collected and calculated by Ministry of Agriculture and Land Reclamation - Economic Affairs Sector - Central Administration of Agricultural Economics - Agricultural Economics Bulletin - different numbers for period 2001-2015.

**Table 3 :** Economic efficiency indicators for producers of potatoes and oranges during periods of study

Crop	Indicator	Average of period 2001-2005	Average of period 2006-2010	Average of period 2011-2015	(F) between variables	Average of period 2001-2015
Cumin	cost per ton (pounds	2915	4366	5697	96.2*	4659
	net return per acre (pounds / acre)	2999	5415	6208	43*	4874
	Revenue / costs	2.52	3.13	2.83	-	2.85
	% unit cost / price	39.4	32.2	35.3	-	35.2
Anise	cost per ton (pounds	2987	3718	4583	71.3*	3763
	net return per acre (pounds / acre)	2359	4440	7313	53.4*	4704
	Revenue / costs	2.45	2.89	3.32	-	2.98
	% unit cost / price	41.3	35.3	30.9	-	34.6
Coriander	cost per ton (pounds	1609	2182	2995	31.6*	2262
	net return per acre (pounds / acre)	1982	3576	3257	28.3*	2938
	Revenue / costs	2.44	2.73	2.14	-	2.41
	% unit cost / price	40.9	36.5	45.6	-	41.2

Source: compiled and calculated by Ministry of Agriculture- Economic Affairs Sector -Central Administration of Agricultural Economics-bulletins agricultural economy - different numbers for period 2001-2015, from a table (2).

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