



Impact of Agricultural Policies on the Egyptian Cotton Sector Using Policy Analysis Matrix

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Authors' contributions

This work was carried out in collaboration among all authors. Author MAE designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MAE, TA and ME managed the analyses of the study. Author MAE managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The Egyptian cotton sector is considered one of the most important export strategic sectors in Egypt, where the Egyptian government takes many agricultural policies that lead to an increase in exports of that crop to foreign markets, as these policies that the government takes have a major impact on the producers of that crop, and this study examined the impact of Agricultural policies on the Egyptian cotton crop, using the policy analysis matrix to know the effect of government policies on the producers of that crop and also the impact of those policies on Egyptian exports of the cotton crop, and the results showed that when comparing the financial and economic performance of the elements of cotton crop production, the financial performance was less than the economic performance on all cost items except workers' wages [1], indicating that the Government is subsidizing cost items, thereby supporting cotton producers. Comparing the average variable costs of cotton during the study period financially and economically shows that the financial valuation exceeds the economic valuation, with the average variable costs of \$418.36 at market prices [2] ,

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amounting to \$368.84 at world prices, The results also showed that the Nominal Protection Coefficient for the output of the Egyptian cotton in the period under study (2000-2017) was 0.74, indicating the lack of a fair production policy during that period, perhaps due to the fact that the value of the Nominal Protection Coefficient for the production of the Egyptian cotton crop was lower than the correct one. It also indicated that the value of the Nominal Protection Coefficient for production supplies was 0.92, which indicates a decrease in government support for that crop compared to the value of the effective protection factor of 0.72 during the period under study (2000-2017). This indicates that the factor of the cost of domestic resources for the Egyptian cotton crop is 0.47, and this indicates that the Egyptian cotton has a comparative advantage in foreign markets, the study recommended Maintaining the foreign markets of the Egyptian cotton crop, as it has a global comparative and competitive advantage, and provides the state with foreign exchange, which contributes significantly to the Egyptian national economy.

Keywords: Policy analysis matrix; nominal protection coefficient; effective protection coefficient; domestic resource costs; cotton.

1. INTRODUCTION

The Egyptian government is trying to find solutions to many of the production and export problems related to Egyptian agricultural crops, as agricultural exports are the most important sources of Egyptian national income, so the development of agricultural exports is one of the most important priorities of the Egyptian economic and agricultural policy as prices are the main factor in directing economic resources to obtain the maximum profit From the exploitation of those resources [3] , where the Egyptian government takes many agricultural policies that lead to an increase in exports of that crop to foreign markets [4] , as these policies that the government takes have a major impact on the producers of that crop, and this study examined the impact of Agricultural policies on the Egyptian cotton crop, using the policy analysis matrix to know the effect of government policies on the producers of that crop and also the impact of those policies on Egyptian exports of the cotton crop [5] , the problem of this study is The policies taken by the Egyptian government during the period (2000-2017) had a significant impact on the economies of strategic crops sectors, the most important of which is the Egyptian cotton sector [6], and also those policies had an impact on the exports of that crop to foreign markets [7], and as a result of government intervention in the agricultural policies there have been some price distortions both at the local level and at the external level [8]. These government interventions have led to the contraction of the area under cotton cultivation from 518.32 (1000 acres) in 2000 to 216.95 (1000 acres) in 2017. [9], thus, reducing cotton exports from 63.2 (1000 Tons) in 2000 to

about 58.3. [10]. This leads to the decline of the producers of this crop from its cultivation [2], as well as the continuous change in agricultural policies that lead to a lack of optimal utilization of production resources [11]. The study aims to: Knowing the effect of the policies issued by the Egyptian government on Egyptian cotton exports, as well as studying the impact of government intervention in marketing and pricing the Egyptian cotton crop during the study period, Knowing the effect of government decisions on the prices and requirements of production and the competitive advantage of the Egyptian cotton crop during the study period [12] The study assumes that the policies issued by the Egyptian government are responsible for the price distortions of the Egyptian cotton sector, whether at the level of production or export [13]. to achieve its objectives, this study was based on: Descriptive and quantitative analysis methodology, also an estimate of some of the indicators of the Policy Analysis Matrix (PAM), as these indicators give evidence of the impact of agricultural policy on the amount of cotton production [14].

2. MATERIALS AND METHODS

To achieve the objectives of this study, the impact of the agricultural price policy for the cotton crop was evaluated as shown in the following sections:

2.1 Policy Analysis Matrix (PAM)

The Agricultural Policy Analysis Matrix is used to assess the impact of government policies on the efficiency of agricultural resources, such as the profitability of agricultural producers, prices of

productive resources, agricultural production supplies, by comparing the profits and costs of the Egyptian cotton crop, by comparing the profits and costs of the Egyptian cotton crop, by comparing Market and world prices [15], these policies are assessed by measuring both the higher protection factor for outputs and inputs, the effective protection factor, and the comparative advantage factor, The policy analysis matrix is also used to measure market and economic price differences, when the market is in full competition, and the economy is in general balance [16].

To build a policy analysis matrix, costs were divided into tradeable production inputs, non-tradeable production inputs called local resources, profits, these two types of costs mentioned earlier are calculated using: market prices [17], economic prices. It calls the difference between market prices and economic prices is an indicator of the different market prices from the economic prices, the overall structure of the policy analysis matrix is illustrated by Table (1) The economic indicators of the agricultural policy analysis matrix can be found by estimating some measures to identify the essence of the government's policy on The Egyptian cotton crop, whether it is a policy that supports the producers of that crop, or the policy of direct taxation, or indirect taxes [18].

2.1.1 Nominal protection coefficient on tradable outputs (NPCo)⁽¹⁾

Nominal Protection Coefficient (NPCO) is a comparison between the Domestic price of cotton crop output and the global price of those outputs after converting them using the exchange rate of the national currency as presented in Eq. 1.

$$NPCO = \frac{A}{H} \quad (1)$$

- **NPC > 1** means that domestic prices are higher than border prices, indicating implicit subsidy for producers,
- **NPC < 1** means that domestic prices are lower than border prices, indicating that producers incur implicit taxes.
- **NPC = 1** means absence of intervention in price policy, as well as absence of protection.

⁽¹⁾ Nominal Protection Coefficient on Tradable Outputs (NPCO).

2.1.2 Nominal protection coefficient on tradable outputs (NPC1)⁽²⁾

Nominal Protection Coefficient on Tradable Inputs is the ratio between domestic and economic prices of outputs as presented in eq. 2.

$$NPC1 = \frac{B}{I} \quad (2)$$

- **NPC1 > 1** means that the government subsidizes production inputs.
- **NPC1 < 1** means that the government imposes taxes on inputs.
- **NPC1 = 1** means lack of distortions in input prices.

2.1.3 Effective protection coefficient (EPC)⁽³⁾

Effective Protection Coefficient (EPC) is an extension of the concept of the Nominal Protection Coefficient. However, it measures price distortions at the level of output and input markets, where it measures the net impact of economic policy on domestic output and input markets [19]. It is the ratio of the value added⁽⁴⁾ of a product in domestic market price to the value added in economic price as presented in eq. 3.

$$EPC = \frac{A-B}{H-I} = \frac{G}{N} \quad (3)$$

- **EPC = 1** means lack of distortions.
- **EPC > 1** means effective protection or incentives for producers.
- **EPC < 1** means negative protection in the form of taxes imposed on producers.

It should be noted that the nominal protection coefficient for both inputs and outputs is used to estimate the structure of incentives at the commodity level, while effective protection coefficient is a measure of price incentives.

2.1.4 Domestic resource cost ratio (DRC)⁽⁵⁾

It is the ratio between benefits and costs. It is a measure of efficiency or comparative advantage of a certain commodity system. A commodity system is considered to enjoy a comparative

⁽²⁾ Nominal Protection Coefficient on Tradable Inputs (NPC1).

⁽³⁾ Effective Protection Coefficient (EPC).

⁽⁴⁾ Value added = Revenue – Inputs excluding domestic factors

⁽⁵⁾ Domestic Resource Costs (DRC).

Table 1. General structure of policy analysis matrix (PAM)

Statement	Total revenue	Total production input	Total cost of domestic			Net revenue	Value added
			Total labor	Total rent land	Total		
Financial prices	A	B	C	D	E	F	G
Economic Prices	H	I	J	K	L	M	N
Policy impact	O	P	Q	R	S	T	U

Source: Eric A. Monke Scott R. Pearson, *The Policy Analysis Matrix for Agricultural Development, 1989*

Where:

A	Gross profit at Domestic market prices
H	.Total profit at border prices
B	.The value of production supplies at Domestic market prices
I	.The value of production supplies at border prices
C	.The value of Labor at Domestic prices
J	The.Labor value adjusted by the conversion coefficient
D	.Rent land at Domestic prices
K	.(Rent land at border prices (same at Domestic price)
E	Total value of Labor and land at Domestic prices
L	Total value of Labor and land at border prices
F	Net profit at domestic market pricesWhere: F= [A – (B+E)]
M	Net profit at border market pricesWhere: M= [H – (I + L)]
G	Value added at domestic market prices where G= (A – B)
N	Value added at border market prices where N= (H – I)
O	Impact of agricultural policy on total profits where O= (A – H)
P	Impact of agricultural policy on production inputs prices where P= (B – I)
S	Impact of agricultural policy on the total value of domestic resources where S= (E – L)
T	Impact of agricultural policy on total net profit where T= (– M F)
Q	Impact of agricultural policy onTotal labor where Q= (C - J)
R	Impact of agricultural policy onTotal rent Land where R= (D – K)
U	The impact of agricultural policy on value added where U= (G – N)

advantage when DRC is less than or equal to the equilibrium exchange rate. It can be computed as presented in eq. 4.

$$DRC = \frac{J + K}{H - I} = \frac{L}{N} \tag{4}$$

- **DRC < 1** means that using less than one unit of domestic resources yields one unit of hard currency, indicating that the country enjoys a comparative advantage.
- **DRC > 1** means that more than one unit of domestic resources is used to acquire one unit of hard currency, indicating that country has no comparative advantage in the global market.

Alternatively, the opportunity cost of using domestic resources exceeds the value added estimated at world prices, indicating that the economic activity is unprofitable.

2.2 Sources of Data

The study relied on the published and unpublished secondary data issued by government agencies such as the Economic Affairs Sector of the Ministry of Agriculture, the Central Agency for Public Mobilization and Statistics, the World Bank, Food and Agriculture Organization, the International Information Network.

3. RESULTS AND DISCUSSION

3.1 Input Cost Analysis using Domestic and Border Prices

The financial evaluation of the average production costs was calculated using market and international prices during the study period, where the results indicate the following:

3.2 Domestic Resource Cost

3.2.1 Labor wages

Table 2 shows that wages of labor hired for cotton crop production in market prices is higher than wages computed in border prices. Average value of labor wages in financial prices reached 201.46 US\$, while that computed in economic prices reached 134.98 US\$ [20].

3.2.2 Cost of machinery

Table 2 shows that cost of machinery rented for cotton crop production in market prices is less than that computed in border prices. Average rent in financial prices reached 64.60 US\$, while that computed in economic prices reached 71.06 US\$ [21].

3.2.3 Cost of production inputs

Table 2 shows that average cost of production inputs in financial prices (including fertilizers, pesticides and seeds) reached 114.14 US\$, while that computed in economic prices reached 124.64 US\$.

3.3 Total Variable Costs and Total Costs

When comparing the average variable costs of cotton crop at market and world prices during the study period, Through Table 1. in the Annex it is found that the financial valuation is greater than the economic valuation, with the average

variable costs of 418.36 US\$ at market prices, amounting to 368.84 US\$ at world prices, indicating a rise The cost of locally changing costs, their global decline, and the evaluation of total production costs at world prices, and comparing them with their value at market prices, it turns out that the economic assessment is greater than the financial evaluation during the period (2000-2017), where the financial evaluation of the total costs of the average period 674.28 US\$, reached 686.95 US\$ at world prices, indicating that cotton crop producers have received government support for total production costs [22] .

3.4 Impact of Agricultural Price Policy on cotton Crop

Evident from Table 3 the results of PAM applied to cotton crop in Egypt over the period (2000-2017), that average revenue reached US\$ 975.49 in financial prices, while reached US\$ 1316.91 in economic prices, resulting in a policy impact of US\$ 341.42 , indicating that cotton producers incurred implicit taxes estimated at US\$ 341.42 as average of the study period [23].

Results show that cotton farmers bear costs of production inputs during the study period (2000-2017), estimated at US\$ 114.14 in financial prices, corresponding to US\$ 124.64 in economic prices, resulting in a policy impact of US\$ 10.50, which means that cost of production inputs declined by US\$ 10.50 during the study period.

Table 2. Production cost items assessed in financial and economic prices of Egyptian cotton crop in Egypt over the period 2000-2017^{*}

	Statement	Financial prices	Economic prices
Cost of domestic resource	Labor Wages	201.46	134.98
	Wages of Machinery	64.60	71.06
	Rent	255.92	318.11
	General Expenses	38.16	38.16
	Total cost of domestic resource	560.14	562.31
	Cost of production inputs	Seeds Cost	12.75
Organic Fertilizers		20.65	20.65
chemical Fertilizers		62.83	69.11
Insecticides		17.91	21.49
Total production inputs		114.14	124.64
Total costs		674.28	686.95

Source: Author Calculation, 2020

^{*} Economic value has been computed using conversion factors estimated by experts from the World Bank in 2000, as follows: 1.12 for seeds; 1.45 for chemical fertilizers; 1.09 for pesticides; 0.75 for human labor; 1.12 for machinery. Other items remained unchanged. As for land, opportunity cost is the revenue producer can get from his land without bearing the burdens of risks in agricultural production, which is usually the economic rent (leasing to others for one year) assessed on the basis of duration of crop stay in land (World Bank, 2000).

Table 3. Policy analysis matrix for cotton crop in Egypt over the Period 2000-2017

Statement	Total revenue	Total production input	Total cost of domestic			Net Revenue	Added Value
			Total labor	Total rent	Total		
Financial prices	975.49	114.14	304.22	255.92	560.13	301.22	861.35
Economic prices	1316.91	124.64	244.19	318.11	562.30	629.97	1192.27
Policy impact	(341.42)	(10.50)	60.03	(62.19)	(2.17)	(328.75)	(330.92)

Numbers between the brackets are Negative
 Source: Author Calculation, 2020

In addition, cotton farmers incurred implicit taxes on hired labor estimated at US\$ 60.03 as average of the study period. As for net revenue, which reflects implicit taxes incurred by producers and subsidy received, it can be noted from Table 3 that it amounted to US\$ 301.22 in financial prices and US\$ 629.97 in economic prices, resulting in a policy impact of US\$ 328.75, indicating that cotton producers incurred implicit taxes amounting to US\$ 328.75 as average of the study period.

3.4.1 Nominal protection coefficient on outputs (NPC_o)

As shown in Table 4, Nominal Protection Coefficient on Outputs amounted to 0.74, which is less than unity, indicating absence of fair production policy over the study period 2000-2017. In other words, domestic prices of cotton is lower than international prices, resulting in cotton producers incurring implicit taxes amounting to 26% due to receiving only 74% of the real price they should get for their product. Such result means that the implemented policy was not in favor of domestic cotton producers.

3.4.2 Nominal protection coefficient on inputs (NPC_i)

Results in Table 4 show that Nominal Protection Coefficient on Inputs amounted to 0.92, which is less than unity, indicating very low subsidy on inputs used in cotton production over the study period 2000-2017. In other words, cotton producers received a subsidy as low as 8% on production inputs. This also means that subsidy to cotton producers is diminishing, which complies with the implemented agricultural policy of gradual removal of subsidy on production inputs until reaching price levels proportionate to their economic cost thus international prices. Such finding indicates that the implemented economic liberalization policy resulted in very

limited subsidy on production inputs for cotton producers.

Table 4. Nominal protection coefficient, effective protection coefficient and domestic resource cost ratio for cotton crop in Egypt over the period 2000-2017

Items	Value
NPC _o	0.74
NPC _i	0.92
EPC	0.72
DRC	0.47
SRP	0.09
PPC	0.68

Source: Calculated from Table 3

3.4.3 Effective protection coefficient (EPC)

It is evident from Table 4. that Effective Protection Coefficient amounted to 0.72, which is less than unity, indicating that cotton producers incur implicit taxes. In other words, value added in domestic prices is lower than that in international prices, which means absence of protection policy during the study period. Such result means that the government has been imposing taxes, either direct or indirect, or it has been subsidizing cotton imports.

3.4.4 Domestic resources cost ratio DRC (Comparative Advantage)

Results in Table 4. show that Domestic resource Cost Ratio amounted to 0.47, indicating that Egypt enjoyed a comparative advantage in cotton production during the study period 2000-2017, which means that domestic production of cotton is preferred to dependency on imports.

3.4.5 Rate of government support for Egyptian cotton producers

Table 4. shows that the government's support rate for Egyptian cotton crop producers was 0.09

during the period (2000-2017), indicating a lower rate of government support for producers of this crop, as the government made political decisions to liberalize the international trade of the Egyptian cotton crop.

3.4.6 Government support policy cost coefficient

Table 4. shows that the cost Coefficient of the government support policy for Egyptian cotton crop during the period (2000-2017) was 0.68, which indicates that the value is added greater than the cost of local resources, as 0.68 US\$ of the cost of Domestic resources gives one US\$ in value added, which is evidence of increased efficiency Domestic resources.

4. CONCLUSION AND RECOMMENDATIONS

The agricultural exports are the most important sources of Egyptian national income, so the development of agricultural exports is one of the most important priorities of the Egyptian economic and agricultural policy as prices are the main factor in directing economic resources to obtain the maximum profit from the exploitation of those resources, where the Egyptian government takes many agricultural policies that lead to an increase in exports of that crop to foreign markets, as these policies that the government takes have a major impact on the producers of that crop, and this study examined the impact of Agricultural policies on the Egyptian cotton crop, using the policy analysis matrix to know the effect of government policies on the producers of that crop and also the impact of those policies on Egyptian exports of the cotton crop, The results showed that the financial value of workers' wages in the production of cotton at market prices exceeded the border prices, while the values of the nominal protection coefficients of outputs were about 0.74, Nominal protection coefficient values for production inputs were 0.92 , while the effective protection values for cotton were 0.72, The values of the comparative advantage of the cotton crop, were 0.47, and The results showed that when comparing the financial and economic performance of the elements of cotton crop production, the financial performance was less than the economic performance on all cost items except workers' wages, indicating that the Government is subsidizing cost items, thereby supporting cotton producers. Comparing the average variable costs of cotton during the study period financially and economically shows

that the financial valuation exceeds the economic valuation, with the average variable costs of \$418.36 at market prices, amounting to \$368.84 at world prices, Through the results of this study to improve the competitive level of Egyptian cotton in foreign markets, and the government's intervention to provide support to the producers of that crop, and to support the requirements of agricultural production, the study recommended :

- I. The government does not impose indirect taxes on farmers of the cotton crop, which leads to these farmers obtaining a high income, thus achieving a better standard of living for them, and thus the desire of these farmers to produce this crop and increase the areas grown from that crop.
- II. The Egyptian government intervenes to set fixed prices for cotton crop, and to announce those prices before the dates of agriculture.
- III. Maintaining the foreign markets of the Egyptian cotton crop, as it has a global comparative and competitive advantage, and provides the state with foreign exchange, which contributes significantly to the Egyptian national economy.
- IV. The government intervenes to support the producers of that crop and to provide support for agricultural production supplies.
- V. Activating the role of the cooperative sector, to provide agricultural production supplies for the Egyptian cotton crop at prices that compete with the private sector.
- VI. Developing the marketing apparatus of agricultural goods and products, which leads to reduced marketing costs, higher marketing efficiency, and thus higher income for the producers of that crop and higher standard of living.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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ANNEX

Table 1. Production cost items are estimated financially and economically for The Egyptian cotton crop during the period (2000-2017)

Year	Wages of labors		Machine fees		Price of seeds		Organic fertilizer		Chemical fertilizer		Price of pesticides		Public expenses		Total variable costs		Rent the land		Total cost	
	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic	Financial	economic
2000	171.92	115.19	62.13	68.34	11.49	12.07	20.45	20.45	43.32	47.65	23.36	28.03	35.60	35.60	368.26	327.32	222.47	276.52	590.73	603.84
2001	162.25	108.70	50.26	55.29	10.14	10.65	15.93	15.93	41.40	45.54	14.90	17.88	29.50	29.50	324.39	283.50	196.12	243.78	520.51	527.28
2002	131.12	87.85	45.56	50.11	6.89	7.23	14.45	14.45	38.45	42.29	19.11	22.93	24.22	24.22	279.80	249.09	178.68	222.10	458.48	471.19
2003	110.75	74.20	36.58	40.23	5.64	5.92	14.36	14.36	36.75	40.42	10.94	13.13	21.54	21.54	236.54	209.80	137.76	171.23	374.30	381.03
2004	112.65	75.48	34.86	38.35	5.49	5.76	12.91	12.91	36.31	39.94	12.27	14.72	22.76	22.76	237.24	209.91	129.76	161.29	367.00	371.20
2005	120.09	80.46	50.88	55.96	6.23	6.54	14.36	14.36	48.63	53.49	19.38	23.26	25.96	25.96	285.53	260.03	167.16	207.78	452.69	467.82
2006	134.13	89.87	48.14	52.95	6.28	6.59	16.57	16.57	48.14	52.95	14.65	17.58	26.86	26.86	294.77	263.38	222.21	276.21	516.99	539.60
2007	149.24	99.99	46.85	51.53	11.00	11.55	12.60	12.60	55.72	61.29	14.73	17.67	28.92	28.92	319.05	283.56	248.61	309.02	567.66	592.58
2008	184.08	123.33	60.56	66.62	19.14	20.10	22.09	22.09	78.60	86.46	19.70	23.64	38.47	38.47	422.64	380.71	335.57	417.12	758.21	797.83
2009	181.08	121.32	62.40	68.64	17.86	18.75	20.56	20.56	82.06	90.27	16.41	19.69	38.06	38.06	418.43	377.29	302.46	375.95	720.88	753.24
2010	226.61	151.83	76.84	84.53	18.32	19.24	32.37	32.37	88.05	96.85	16.54	19.85	45.89	45.89	504.63	450.56	308.26	383.17	812.89	833.73
2011	279.80	187.47	75.01	82.51	16.52	17.34	36.41	36.41	89.00	97.90	16.52	19.82	51.24	51.24	564.49	492.68	310.65	386.13	875.13	878.82
2012	274.76	184.09	92.47	101.72	17.34	18.20	38.80	38.80	95.61	105.17	17.50	21.00	53.66	53.66	590.15	522.65	316.21	393.05	906.36	915.70
2013	264.18	177.00	79.33	87.26	16.30	17.12	21.83	21.83	83.69	92.06	23.73	28.47	48.91	48.91	537.97	472.65	280.63	348.82	818.60	821.47
2014	281.59	188.67	86.89	95.58	17.52	18.40	22.04	22.04	77.00	84.70	24.16	28.99	51.01	51.01	560.22	489.39	274.81	341.59	835.03	830.98
2015	231.43	155.06	80.74	88.81	17.42	18.29	17.29	17.29	68.91	75.80	19.50	23.40	43.56	43.56	478.85	422.22	253.14	314.66	732.00	736.87
2016	337.74	226.29	88.97	97.87	14.26	14.98	14.76	14.76	68.83	75.71	21.74	26.09	54.66	54.66	600.97	510.36	469.81	583.97	1070.78	1094.33
2017	272.85	182.81	84.30	92.73	11.64	12.22	23.96	23.96	50.39	55.43	17.26	20.72	46.06	46.06	506.45	433.91	252.21	313.50	758.67	747.42
Average	201.46	134.98	64.60	71.06	12.75	13.39	20.65	20.65	62.82	69.11	17.91	21.49	38.16	38.16	418.36	368.84	255.92	318.11	674.27	686.94

Source: Calculated using on data collected from:

- the Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Central Administration for Agricultural Economics, Bulletin of Agricultural Economics; Different Issues,2000-2017.
- The Central Administration for Public Mobilization and Statistics, Foreign Trade Database, Foreign Trade Bulletins; Different Issues,2000 – 2017

Table 2. Egyptian Cotton Crop Agricultural Policy Analysis Matrix (2000-2017) *

Year	Price of the farm		Productivity		Total revenue		The impact of politics	Production supplies		The labor		The land		Total		Profit		Value added	
	Financial	Economic	Financial	Economic	Financial	Economic		Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic	Financial	Economic
2000	100.84	136.13	6.78	6.78	683.66	922.95	-239.28	98.62	108.20	269.64	219.12	222.47	276.52	492.11	495.65	92.94	319.10	585.05	814.75
2001	101.43	136.94	7.23	7.23	733.37	990.05	-256.68	82.38	90.01	242.01	193.49	196.12	243.78	438.13	437.28	212.86	462.77	650.99	900.04
2002	91.12	123.01	6.88	6.88	626.89	846.30	-219.41	78.89	86.91	200.90	162.19	178.68	222.10	379.58	384.29	168.41	375.10	547.99	759.39
2003	93.49	126.21	7.07	7.07	660.97	892.31	-231.34	67.68	73.83	168.86	135.97	137.76	171.23	306.62	307.20	286.67	511.28	593.29	818.49
2004	99.25	133.99	6.97	6.97	691.80	933.93	-242.13	66.98	73.34	170.27	136.58	129.76	161.29	300.02	297.87	324.80	562.73	624.83	860.60
2005	125.11	168.90	6.22	6.22	778.20	1050.57	-272.37	88.60	97.65	196.93	162.38	167.16	207.78	364.09	370.17	325.51	582.75	689.60	952.92
2006	136.05	183.67	7.1	7.1	965.95	1304.04	-338.08	85.64	93.70	209.13	169.68	222.21	276.21	431.35	445.90	448.96	764.44	880.31	1210.34
2007	152.25	205.54	6.86	6.86	1044.45	1410.00	-365.56	94.05	103.12	225.01	180.44	248.61	309.02	473.61	489.46	476.79	817.43	950.40	1306.89
2008	148.37	200.29	6.46	6.46	958.45	1293.90	-335.46	139.53	152.29	283.11	228.42	335.57	417.12	618.68	645.54	200.23	496.08	818.92	1141.62
2009	122.46	165.32	6.3	6.3	771.51	1041.54	-270.03	136.89	149.27	281.54	228.02	302.46	375.95	583.99	603.97	50.63	288.29	634.62	892.26
2010	238.35	321.78	6.49	6.49	1546.91	2088.33	-541.42	155.29	168.31	349.35	282.25	308.26	383.17	657.61	665.42	734.02	1254.60	1391.63	1920.02
2011	179.68	242.57	7.74	7.74	1390.72	1877.47	-486.75	158.44	171.47	406.05	321.21	310.65	386.13	716.69	707.35	515.58	998.65	1232.27	1706.00
2012	193.03	260.59	5.59	5.59	1079.03	1456.69	-377.66	169.25	183.18	420.90	339.47	316.21	393.05	737.11	732.52	172.67	540.99	909.78	1273.51
2013	214.55	289.64	5.61	5.61	1203.61	1624.87	-421.26	145.55	159.48	392.41	313.17	280.63	348.82	673.04	661.99	385.01	803.40	1058.05	1465.39
2014	165.59	223.55	5.3	5.3	877.64	1184.82	-307.17	140.73	154.13	419.49	335.26	274.81	341.59	694.30	676.85	42.61	353.84	736.92	1030.68
2015	161.87	218.53	4.22	4.22	683.10	922.18	-239.08	123.13	134.79	355.73	287.43	253.14	314.66	608.87	602.09	-48.90	185.31	559.97	787.39
2016	270.41	365.06	6.97	6.97	1884.78	2544.45	-659.67	119.60	131.54	481.38	378.82	469.81	583.97	951.18	962.79	814.00	1450.12	1765.18	2412.91
2017	129.34	174.61	7.56	7.56	977.82	1320.05	-342.24	103.25	112.32	403.21	321.59	252.21	313.50	655.42	635.10	219.15	572.63	874.57	1207.73
Average	151.29	204.24	6.52	6.52	975.49	1316.91	-341.42	114.14	124.64	304.22	244.19	255.92	318.11	560.13	562.30	301.22	629.97	861.35	1192.27

* Economic value has been computed using conversion factors estimated by experts from the World Bank in 2000, as follows: 1.12 for seeds; 1.45 for chemical fertilizers; 1.09 for pesticides; 0.75 for human labor; 1.12 for machinery. Other items remained unchanged. As for land, opportunity cost is the revenue producer can get from his land without bearing the burdens of risks in agricultural production, which is usually the economic rent (leasing to others for one year) assessed on the basis of duration of crop stay in land (World Bank, 2000).

- the Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Central Administration for Agricultural Economics, Bulletin of Agricultural Economics; Different Issues, 2000-2017.
- The Central Administration for Public Mobilization and Statistics, Foreign Trade Database, Foreign Trade Bulletins; Different Issues, 2000-2017

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