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The Impact of Price Policyon Production & Consumption of Rice Crop in Egypt

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Abstract: The research problem is summarized in reducing the cultivated area of the crop, therefore, the research aimed to study the development of some production, economic, and consumption variables for the rice crop, with a study of some ministerial decisions during the study period and their impact on the path of the rice crop, in addition to studying the impact of the partial equilibrium model, which shows the impact of crop price policies on both the producer and the consumer. The study results showed a statistically significant annual decrease in the cultivated area, production, and exports during the study period by about 21,100 feddans, 0.01 tons per feddans, 101,200 tons, and 58,600 tons, respectively. Meanwhile, the local price, consumer price, export price, total costs, and net return all increased annually by a statistically significant rate of approximately 180, 460,500, 500, and 190 EGP, respectively, during the study period. By studying some ministerial decisions related to the area, production, and export of rice during the period (2000-2021), It was found that the cultivated area and rice production decreasedDuring the period from 2001-2005, rice was exported, and in 2017 rice was imported, and a partial equilibrium model was presented showing the government's preference in the price policy of the crop.
One of the most important recommendations
- Growing varieties that can tolerate drought and salinity
- Establishing guidance fields for farmers on proper irrigation methods to conserve water
- Activating the role of contract farming by providing fair prices to farmers
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Keywords: Rice crop, Price policy, Ministerial decisions, Partial equilibrium model.

Introduction:

Price and production policies are among the most important economic tools for achieving desired effects in increasing agricultural production. Price distortions can lead to several problems that hinder the development of crop production. Prices are the primary driver of production and can direct farmers towards the cultivation of specific crops, particularly rice. Rice is one of the main grain crops in Egypt and is an essential food crop for obtaining energy and carbohydrates. It also provides employment opportunities in rice paddies and is a self-sufficient crop that is used in the production of concentrated animal feed.

The main challenge with rice production in Egypt is its large water requirements, which have prevented an increase in the area cultivated with rice and even reduced it. This has resulted in a halt in exports due to ministerial decisions that prohibit the export of rice and offer it on the domestic market to achieve self-sufficiency. Additionally, some ministerial decisions reduce the area cultivated with rice to conserve water consumption in rice farming. However, there are currently some methods for cultivating rice using relatively salty water or using rice strains that are water-efficient, such as "the dry rice strain".

Price policy also plays a significant role in distributing production to consumers and affects the economic efficiency of resources and changes in the surplus of the producer and consumer. Therefore, successful price policy requires a thorough understanding of the reactions of producers and consumers to changes in prices.

In 2021, the area of rice cultivation in Egypt was approximately 1105 thousandfeddans, which decreased of about 37.5% compared to 2008, which was around 1770thousandfeddans. The rice production in Egypt in 2021 was about 4242thousand tons, which decreased of about 41.4% compared to 2008, which was about 7240thousandtons. Since 2017, the export of rice has been prohibited due to some ministerial decisions that aim to provide rice production for domestic consumption.

Research Problem:

A range of measures have been implemented by the government to regulate rice cultivation due to the imbalance in rice cultivation, production, and export

caused by the crop's high-water requirements. This issue has resulted in ministerial legislative decisions that restrict rice cultivation and decrease the cultivated area to conserve irrigation water, leading to a reduction in production and the prohibition of rice exportation since 2017. This has resulted in some price distortions in the rice crop, with prices being the primary driver of production. The problem lies in the reduction of the crop's cultivated area and subsequent decreased production, leading to a reliance on imports and the prohibition of export to prioritize domestic consumption. Consequently, the crop's price has increased, creating domestic market imbalances and impacting Government revenue, as well as producers and consumers.

Objectives:

The objective of this research is to analyze the impact of ministerial decisions during the study period on the trajectory of the Egyptian rice crop. It also aims to investigate the government's interventions in the production and prices of rice crop, a strategic crop in Egypt from 2000 to 2021. The study assesses the positive and negative effects of these policies on producers, consumers, foreign currency, and government revenues, considering government interventions in the market. Additionally, the study measures the net economic loss for both producers and consumers. To achieve these objectives, the study analyzes various indicators such as cultivated area, productivity, production, farm price, consumer price, export price, total costs, and net return for the crop's production, economic, and consumption indicators. Furthermore, the study examines the quantity of rice crop consumption and exports during the period (2000-2021), providing insights into the impact of government policies on the rice crop industry.

Methodology and Data Sources:

This research employs descriptive and quantitative statistical analysis methods to measure production, economic, and consumption indicators related to the rice crop. The research also evaluates the impact of certain ministerial decisions on the cultivated area, production, and exports of the rice crop during the period between 2000 and 2021. Subsequently, the study examines the partial equilibrium model, which is a widely used tool to measure the impact of government intervention in price policies on the producer, consumer, foreign currency, and government revenue as a result of implementing specific policy.

The model measures two types of price policies: one with government intervention, and the other without government intervention, by estimating three main indicators. The first measures government revenues by calculating changes in government and foreign currency revenues. The second measures welfare by calculating changes in producer and consumer surplus. The third measures economic efficiency by calculating the net economic loss at the producer, consumer, and community levels. The research draws on published and unpublished data issued by the Economic Affairs Sector of the Ministry of Agriculture and Land Reclamation, as well as various statistical publications related to agricultural statistics, food balance sheets, cost statistics, and net returns. Moreover, the study consults some research and studies related to the research topic.

Results:

Firstly: Analysis of the Production, Economic, and Consumption Indicators of Rice Crop:

1. **Evolution of Some Production Indicators of Rice Crop during the period (2000-2021):**

Based on table (I) in the appendix, it is evident that the area cultivated with rice in Egypt experienced fluctuations, ranging from a minimum of approximately 859 thousandfeddans in 2018 to a maximum of about 1770 thousandfeddans in 2008, with anaverage of around 1384 thousandfeddans per year during the study period.By estimating the general trend equation of the area cultivated with rice, as shown in table (1), it was found that the cultivated area of rice in Egypt decreased by approximately 21 thousand feddans per year, which was statistically significant at a probability level of 0.01. The average rate of change was about 1.52% of the annual average. Moreover, the coefficient of determination indicates that around 43% of the changes in the cultivated area are attributed to time, while other factors were not considered in the equation.

Furthermore, the study of table (I) in the appendix indicates that the productivity per feddan of the rice crop fluctuated over time, with a minimum of about 3.63 tons per feddan in 2018 and a maximum of about 4.23 tons per feddan in 2006. The annual average productivity was approximately 3.96 tons per feddan during the study period.

By estimating the general trend equation of the productivity per feddan of the rice crop, it was found that the crop's productivity decreased by approximately 0.01 ton per feddan annually, which was statistically significant at a significance level of 0.01. The average rate of change was about 0.25% of the annual average. Furthermore, the coefficient of determination indicates that around 33% of the changes in rice productivity are attributed to time, while other factors were not included in the equation.

Studyingtable (I) in the appendix, the production data of the rice crop reveals that the lowest quantity reached approximately 3122 thousand tons in 2018,

while the maximum quantity reached about 7240 tons in 2008, with an annual average of around 5505 thousand tons during the study period. By estimating the general trend equation of the production, as shown in table (1), the results indicated that the production had a statistically significant decreasing trend at a significance level of 0.01. The production decreased by approximately 101.22 thousand tons, with an average rate of change of about 1.84% of the annual average. Additionally, the coefficient of determination suggests that approximately 45% of the changes in rice production are attributed to time, while other factors were not considered in the equation.

Table (1): The development of cultivated area, productivity, and total production of rice crop during the period (2000-2021).

No	Data	Equation	Average	Rate of change	R^2	F	Sig.
1	Cultivated area (1000 feddans)	$Y_t^{\wedge}$= 1626.96 - 21.10X (3.9)**	1384	1.52	0.43	15.23	**
2	Productivity (feddan/ton)	Yt^ = 4.12 - 0.01 X (3.12)**	3.96	0.25	0.33	9.71	**
3	Production (1000tons)	Yt^= 6668.8 - 101.22 X (4.08)**	5505	1.84	0.45	16.66	**

Where:
R^2Indicates the coefficient of determination used (**) Indicates significant at the level of 0.01
Source: Collected and calculated from data in table (I) in the appendix.

2. Evolutionof Some Economic Indicators for Rice Production in Egypt during the period (2000-2021)

Upon examining table (II) in the appendix, it is evident that the farm price for the crop has undergone fluctuations during the study period, ranging from a minimum of approximately EGP583 in 2000 to a maximum of around EGP5.964 thousand per ton in 2021, with an annual average of around EGP2.051 thousand.

By estimating the general trend equation, it is apparent that the price has generally increased by approximately EGP180 annually, with a rate of change of around 8.78% from the overall average. The coefficient of determination suggests that approximately 82% of the changes in the price can be attributed to time, while the remaining factors were not included in the equation.

Regarding the consumer price of the crop, it has exhibited a fluctuating trend, ranging from a minimum of approximately EGP1.085 thousand per ton in 2001 to a maximum of around EGP14.340 thousand per ton in 2021, with an annual average of approximately EGP4.516 thousand per ton during the period from 2000 to 2021.

The general trend equation for the consumer crop price, as shown in table (2), indicates a statistically significant increasing trend at a significance levelof 0.01, with an annual increase of approximately EGP460. The rate of change is about 10.85% from the overall average, and the coefficient of determination is around 0.79, suggesting that around 79% of the changes in the consumer price can be attributed to time, while other factors were not included in the equation.

On the other hand, the export price of the crop has a fluctuating trend, ranging from a minimum of around EGP696 in 2000 to a maximum of approximately EGP16.733 thousand in 2021, with an annual average of around EGP4.427 thousand during the period from 2000 to 2021. By estimating the general trend equation, it is evident that the export price has a statistically significant increasing trend at a significance level of 0.01, with an annual increase of about EGP500. The rate of change is approximately 11.29% from the overall average, and the coefficient of determination is around 0.47, indicating that around 47% of the changes in the export price can be attributed to time, while other factors were not considered.

As for the total costs of rice, they increased from about EGP1.685 thousand per feddan at a minimum in 2001 to about EGP14.685 thousand per feddan at a maximum in 2021, with an average annual rate of about EGP5.264 thousand per feddan during the period (2000-2021). The general trend equation took an increasing statistical trend at the 0.01 level of significance, quantitying to approximately EGP500 annually and with a rate of change of about 9.5% from the average total cost. The coefficient of determination indicates that about 85% of the variations in total costs are due to the element of time, while the remaining portion is due to other factors not included in the equation.

The net yield data shown in table (II) in the appendix indicate fluctuations between increases and decreases, with a minimum of about EGP615 in 2000

and a maximum of about EGP8.845 thousand in 2021, with an average of about EGP2.974 thousand during the study period.

The estimated general trend equation for the net yield of the rice crop indicates a statistically significant increasingtrend at the 0.01 level of significance, quantitying to about EGP190 annually with a rate of change of about 6.39% from the average net yield. The coefficient of determination indicates that about 55% of the variations in net yield for the rice crop are due to the element of time, while the remaining portion is due to other factors not included in the equation.

Table (2): The development of some economic indicators for rice production during the period (2000-2021).

No	Items	Equation	Average	Rate of change%	R^2	F	Sig.
1	Domestic price1000 EGP)	Y_t^ = -0.04 +0.18 X (9.55)**	2.051	8.78	0.82	91.23	**
2	Consumer price (1000 EGP)	Y_t^ = -0.81 +0.46 X (8.8)**	4.516	10.85	0.79	77.50	**
3	Export price (1000 EGP)	Y_t^ = -1.33 +0.50 X(4.24)**	4.427	11.29	0.47	17.97	**
4	Total cost (1000 EGP)	Y_t^ = -0.45 +0.50 X(10.81)**	5.264	9.50	0.85	116.85	**
5	Net return (1000 EGP)	Y_t^ = 0.74 +0.19 X(4.90)**	2.974	6.39	0.55	24.04	**

Where: R^2Indicates the coefficient of determination used (**) Indicates significant at the level of 0.01
Source: Collected and calculated from data in table (II) in the appendix.

3. Evolutionof Some Consumption Indicators for The Rice Crop in Egypt during the period (2000-2021).

This section includes a study of the development of total production, available quantity for consumption, and export quantity, as follows:

According to the food balance sheet data presented in table (III) in the appendix, the total production of summer and Neily crops between 2000 and 2021 shows a fluctuating trend, with the lowest production recorded at approximately 3124 thousandtons in 2019 and the highest production at around 7253 thousand tons in 2009. The average annual rate of production is approximately 5572 thousandtons.

However, upon estimating the general trend equation for total rice production, it is evident that there is a statistically significant decreasing trend at a significance level of 0.01. The annual decrease is around 88,450 thousand tons, with a rate of change of about 1.58% from the average total production. The coefficient of determination suggests that roughly 38% of the variations in total production can be attributed to time, while other factors were not considered in the equation.

The data on available for consumption during the study period indicate fluctuations between a minimum of about 4065 thousand tons in 2019 and a maximum of about 6647 thousand tons in 2008, with an average annual rate of about 5137 thousand tons.

The general trend equation for available quantity for consumption, as shown in table (3), took a statistically non-significant decreasing trend at either level of probability.

The data on export quantity during the study period indicate fluctuations between a minimum of about 0.1 thousand tons in 2019 and a maximum of about 1787 thousand tons in 2007, with an average annual rate of about 540 thousand tons.

After analyzing the general time trend equation presented in table(3), it was evident that the trend was decreasing overall, although statistically insignificant at either probability level. The export quantity data during the study period indicates fluctuations between a minimum of around 0.1 thousand tons in 2019 and a maximum of around 1787 thousand tons in 2007, with an average annual quantity of about 540 thousand tons.

Furthermore, the study revealed that the general time trend equation demonstrated a statistically significant decreasing trend at a significance level of 0.01, with an annual decrease of approximately 58,610 thousand tons and a rate of change of 10.86% from the average export quantity. In addition, the determination coefficient value indicated that about 48% of the variations in the export quantity were attributed to the time factor, while the remaining portion was due to other factors that were not included in the equation.

Table (3): The development of some consumption indicators for the rice crop during the period (2000-2021).

No	Items	Equation	Average	Rate of change %	R^2	F	Sig.
1	Total production (1000 tons)	$Y_t^{\wedge}$= 6597.83 - 88.45 X (3.47)**	5572	1.58	38	12.04	**
2	Consumption(1000 tons)	$Y_t^{\wedge}$ = 5319.96 - 15.89 X(0.73)-	5137	0.31	3	0.53	-
3	Quantity of exports(1000 tons)	$Y_t^{\wedge}$ = 1213.67 - 58.61 X(4.26)**	540	10.86	48	18.11	**

Where: R^2 refers to the coefficient of determination used (**) indicates significance at the level of 0.01
(-) indicates insignificance at either probability level.
Source: Collected and calculated from data in table (III) in the appendix.

Secondly: Impactof Ministerial Decisions Related to the Cultivated Area, Production, and Export of Rice:

Economic Impacts of Implementing Ministerial Decisions Issued Related to the Rice Crop in Egypt:

1. **First Scenario: The Results of Implementing Ministerial Decisions on the Cultivated Area of the Rice Crop*:***

The impact of ministerial decisions on the cultivation area of rice in Egypt between 2000 and 2021 is evident from the data presented in table (4). The data shows a decline in the rice cultivation area by approximately 229, 22, 61, 32, and 110 thousand feddans, respectively, which translates to a percentage drop of 15%, 1%, 4%, 2%, and 7% during the period from 2001 to 2005, following the implementation of decision No. 122 in 2000, which aimed to support rice exports by providing a subsidy of around EGP200 per ton. However, in 2001, the cultivated area decreased, possibly due to the lower profitability of rice compared to competing cropslike maize. Rice profitability was approximately EGP709, while maize profitability reached around EGP752. Additionally, the cost of rice cultivation was approximately EGP1685, while maize cultivation costs were around EGP1472 for the same year.

Decision No. 196, which imposed fees on rice exports in 2008, resulted in a reduction in rice exports and cultivation area to conserve water resources, leading to a decrease in the rice cultivation area in 2009 and 2010.

The data in the same table also indicate a decrease in the cultivated area of the rice crop during the period (2009-2015), between a minimum of about 298 thousand feddans in 2012 and a maximum of about 677 thousand feddans in 2010, as a result of the issuance of decision No. 954/730/197 in 2006, 2007, and 2008, which imposes fees on all types of rice exports to provide the rice crop to the local market. The cultivated area decreased by 23%, 38%, 20%, 17%, 20%, 23%, 31% respectively during the period (2009-2015).

In 2016, decision No. 722 was issued, which stopped the export of all types of rice and considered it as a basis year for the following years. This led to a decrease in the area by about 46 thousand feddans, a percentage of approximately 3%.

In 2018, decision No. 1032 was issued, specifying eight governorates for rice cultivation, according to the website of the Ministry ofTrade and Industry, legislative and ministerial decisions, and scattered issues of the Official Gazette of Egypt.

In 2019, decision No. 65 was issued, increasing the number of governorates for rice cultivation to nine, which led to an increase in the cultivated area of rice during the period (2019-2021). Considering 2018 as the base year for the following years, the area increased in 2019 by about 444 thousand feddans due to the increase in the number of governorates cultivating rice. In 2020, the area also increased by about 329 thousand feddans compared to the base year of 2018, and in 2021, the cultivated area increased by about 246 thousand feddans, with a percentage increase of 52%, 38%, 29% for the period from 2019 to 2021 respectively .

2. **Second Scenario: The Results of Implementing Ministerial Decisions on Rice Production*:***

The data in table (5) indicates the impact of ministerial decisions on the total production of rice in Egypt during the period of 2000-2021. The data shows a decrease in production in 2001 due to a decrease in the cultivated area, resulting in a drop in production of approximately 774 thousand tons. However, the production quantity increased from 2002 to 2005, with production quantity of around 104, 174, 350, and 122 thousand tons, respectively, with percentage increases of about 2%, 3%, 6%, and 2% during the period of 2002-2005. This increase was a result of Ministerial Decision No. 122 of 2000, which supported rice exports with a subsidy of EGP200 per ton, leading to a rise in production once again from 2002 to 2005.

On the other hand, table (5) data also demonstrates a decrease in total rice production during the period from 2009 to 2015, with production quantity ranging from a minimum of about 4327 thousand tons in 2010 to a maximum of about 5897 thousand tons in 2012. This decline was due to decisions No. 954/730/197 for the years 2006, 2007, and 2008, which imposed fees on rice exports of all types to ensure an adequate domestic rice supply. Production quantity decreased by 24%, 40%, 22%, 19%, 21%, 24%, and 33%, respectively, during the period from 2009 to 2015.

Furthermore, the data in table (5) highlights the impact of decision No. 722 in 2016, which prohibited the export of all types of rice to conserve water and reduce the cultivation area. This decision led to a decrease in production by about 351 thousand tons in 2017, representing a decline of 7%.

In 2018, decision No. 1032 for the year 2018 was issued to determine eight governorates for rice cultivation, according to the Ministry of Trade and Industry website, legislative and ministerial decisions, Official Gazette of the Egyptian Republic, and various issues.

In 2019, decision No. 65 for the year 2019 was issued to increase the number of governorates for rice cultivation to nine governorates, an increase from the decision made in 2018, leading to an increase in the total production of rice during the period (2019-2021).

Considering 2018 as the baseline year for the following years, production increased by about 1676 thousand tons in 2019, a rate of about 54%, due to the increase in the number of governorates planting rice. Production also increased by about 1319 thousand tons in 2020, a rate of about 42%, while production in 2021 increased by about 1120 thousand tons, a rate of 36% .

Table (4): The impact of ministerial decisions on the cultivated area of the rice crop in Egypt during the period (2000-2021).

Items / Year	Total export (1000 tons)	Decision Nº/Year	Decisionobjective	Decision impact		Comments on the decision
				Change in cultivated area (1000feddans)	%	
2000	**1569**	122 / 2000	Subsidizing the export of rice by about 200 EGP per ton	-	-	Year of the decision
2001	1340			-229	-15	Decrease the cultivated area in2001
2002	1547			-22	-1	
2003	1508			-61	-4	
2004	1537			-32	-2	
2005	1459			-110	-7	
2006	1593	196/2006 730/2007 954/2008	Impose duties on all kinds of rice exports	-	-	Year of the decision
2007	1673					
2008	**1770**					
2009	1369			-401	-23	Decrease the cultivated area through -2009) (2015
2010	1093			-677	-38	
2011	1409			-361	-20	
2012	1472			-298	-17	
2013	1419			-351	-20	
2014	1364			-406	-23	
2015	1216			-554	-31	
2016	**1353**	722/2016	Stop exporting all kinds of rice	-	-	Year of the decision
2017	1307			-46	-3	Decrease the cultivated area
2018	**859**	1032/2018	Identify 8Governorates for rice cultivation	-	-	Year of the decision
2019	1303	65 /2019	Rice cultivation in 9 governorates	444	52	Increase the cultivated area
2020	1188			329	38	
2021	1105			624	29	

Source: Ministry of Trade and Industry website, legislative and ministerial decisions, Official Gazette of the Egyptian Republic, various issues.

3. Third Scenario: The Effect of Ministerial Decisions on Rice Exports:

Table (6) data indicate the impact of ministerial decisions regarding rice on Egyptian exports of rice during the period (2000-2021). The data show an increase in the export'squantity by approximately 670, 338, 419, 750, 1129 thousand tons, respectively, for the period from 2001 to 2005 compared to the year 2000, with a percentage increase of 186%, 94%, 116%, 208%, and 314%, respectively, during the period (2001-2005) compared to the year 2000. This was a result of Ministerial Decision No. 122 for the year 2000 to support rice exports at a rate of EGP200 per ton, to encourage rice exports abroad, leading to an increase in the exportsquantity of the crop.

Table (6) data also indicate the issuance of Ministerial Decision No. 954 for the year 2006, which imposes fees on exports of cargo rice, leading to a decrease in the export'squantity by about 54 thousand tons compared to the previous year 2005.

Meanwhile, the same table data pointed to the issuance of Decisions No. 503 and 718 for the year 2007, which imposed fees on rice exports of EGP200 per ton, followed by Decision No. 196 for the year 2008, which imposed fees on rice exports of EGP300 per ton, with the aim of limiting rice exports to preserve local prices, leading to a decrease in rice exports in 2008.

Table (5): The impact of ministerial decisions on the production of rice in Egypt during the period (2000-2021).

Items / Year	Total export (1000 tons)	Decision N°/Year	Decisionobjective	Decision impact		Comments on the decision
				Change in total production (1000 tons)	%	
2000	**6001**	122 / 2000	Subsidizing the export of rice by about 200 EGP per ton	-	-	Year of the decision
2001	5227			-774	-13	Decrease total production through 2001
2002	6105			104	2	
2003	6175			174	3	
2004	6351			350	6	
2005	6123			122	2	
2006	6744	196/2006 730/2007 954/2008	Impose duties on all kinds of rice exports	-	-	Year of the decision
2007	6868					
2008	**7241**					
2009	5518			-1723	-24	Decrease the total production through (2009 -2015)
2010	4327			-2914	-40	
2011	5665			-1576	-22	
2012	5897			-1344	-19	
2013	5717			-1524	-21	
2014	5461			-1780	-25	
2015	4818			-2423	-33	
2016	**5308**	722/2016	Stop exporting all kinds of rice	-	-	Year of the decision
2017	4958			-350	-7	Decrease total production
2018	**3122**	1032/2018	Identify 8 governorates for rice cultivation	-	-	Year of the decision
2019	4798	65/2019	Rice cultivation in 9 governorates	1676	54	Increase the total production
2020	4441			1319	42	
2021	4242			1120	36	

Source: Ministry of Trade and Industry website, ministerial legislative decisions, official Egyptian Gazette, various issues.

The same table data also indicated the issuance of Decision No. 258 and 450 for the year 2008, which suspended the export of all types of rice from April 2008 until October 2009 to provide rice for the local market, leading to a decrease in the export'squantityin 2008 to about 261 thousand tons after being around 1787 thousand tons in 2007, a decrease of about 1526 thousand tons, or 85% compared to 2007. This also led to a decrease in the export'squantityin 2010 and 2011, with a decrease of about 41 thousandtons and 776 thousand tons, respectively, and a percentage decrease of about 5% and 93% for both years, with 2009 as the base year.

The data in Table 6 indicates that Ministerial Decisions No. 121 and 879 of 2009 were issued, imposing a fee on rice exports of EGP1000 per ton to increase the supply of rice in the local market and reduce the local price. This decision led to a decrease in the quantity of rice exports in 2010 and 2011.

Table (6) data also indicated the issuance of some decisions during the period from 2012 to 2016, including:

-Decision No. 767 for the year 2012, which imposed fees on rice exports of EGP100 per ton instead of EGP1000 from the 2009 decision, leading to an increase in the exports quantity in 2013 by about 304 thousand tons, with a 135% increase in the exports quantitycompared to 2012.

-Decision No. 776 for the year 2014, which imposed fees on rice exports of EGP2000 per ton for 2014, with a collection of $USD280 or its equivalent in EGP per ton, with the aim of providing quantity for the local market, leading to a decrease in the exports quantityin 2014 by about 104 thousand tons, with a decrease of about 47%.

-Decision No. 708 for the year 2015, which imposed fees on rice exports of EGP2000 per ton for 2015, without collecting any other foreign quantity, and with a slight increase in the exports quantityfor 2015, reaching about 27 thousand tons, with a 12% increase.

-Decision No. 722 for the year 2016, which stopped the export of all types of rice to provide quantity for the local market and reduce prices, leading to a decrease in the exports quantityin 2016 to about 100 thousand tons, with a decrease of about 125 thousand tons, or 55% compared to 2012.

It should be noted that there were no exports of Egyptian rice after the decision to stop exports in 2016, leading to the import of a large quantity of rice starting from 2017, reaching about 425 thousand tons according to table (7) data.

This led to the importation of rice starting from 2017 in large quantity, reaching about 425 thousand tons, according to data from table (7).Decision No. 1032 for the year 2018 was also issued, which specifies eight governorates for rice cultivation, i.e., specifying the area. This led to a decrease in the cultivated area and the quantity of production, resulting in an increase in imports in 2019 as a result of Decision No. 1032, where the imports quantityincreased by about 551 thousand tons, an increase of about 130%.

Data from the same table during the period from 2019 to 2021 indicate the issuance of Decision No. 65 for the year 2019, which relates to rice cultivation in 9 governorates. This led to a decrease in imports of the crop by a quantity of about 316 ،344 thousand tons for the years 2020 and 2021, respectively, by a percentage of about 74% and 81% for the same years, as a result of the increase in the area and production of the crop during this period.

Table (6): Impact of ministerial decisions on rice exports in Egypt during the period (2000-2016)

Items / Year	Total export (1000 tons)	Decision Nº/Year	Decisionobjective	Decision impact		Comments on the decision
				Change in total export (1000 tons)	%	
2000	**360**	122 / 2000	Subsidizing the export of rice by about 200 EGP/ton	-	-	Year of the decision
2001	1030			670	186	Increase the exports quantityduring the period (2001-2005)
2002	698			338	94	
2003	779			419	116	
2004	1110			750	208	
2005	1489			1.129	314	
2006	1435	954 /2006	Impose an export duty on the cargo rice	54	4	Year of the decision
2007	**1787**	503&718/ 2007 + 196&450 & 258/ 2008	Imposing a fee on rice exports at 200 EGP/ton + Imposing a fee on rice exports at 300 EGP/ton + stopping the export of rice	-	-	Year of the decision
2008	261			-1.526	-85	Decrease the quantity of exports
2009	**836**	121& 879 /2009	Impose a fee of 1,000 EGP/ton on rice exports	-	-	Year of the decision
2010	795			-41	-5	Decrease the quantity of exports
2011	60			-776	-93	
2012	**225**	767 /2012 776 /2014 708 / 2015 722 /2016	Imposing a fee on rice exports 100 EGP in 2012, an export fee for rice 2000 EGP/ton for the years 2014 and 2015 + Stop exporting all kinds of rice for the year 2016	-	-	Year of the decision
2013	529			304	135	Increase the quantity of exports
2014	120			-105	-47	Decrease the quantity of exports
2015	252			27	12	Increase the quantity of exports
2016	100			-125	-55	Decrease the quantity of exports
2017-2021	There are no rice exports after the decision to stop exporting rice in 2016					

Source: Ministry of Commerce and Industry website, ministerial legislative decisions, Egyptian Official Gazette, various issues.

Table (7): The impact of ministerial decisions on rice imports in Egypt during the period (2017-2021)

Items / Year	Total export (1000 tons)	Decision Nº/Year	Decisionobjective	Decision impact		Comments on the decision
				Change in total import (1000 tons)	%	
2017	**425**	Imports (1000 tons)		-	-	Increase the quantity of imports
2018	210	1032/ 2018	Identify eight provinces for rice cultivation	-215	-50	Decrease the quantity of imports
2019	976	65/2019	Rice cultivation in 9 governorates	551	130	Increase the quantity of imports
2020	109			-316	-74	Decrease the quantity of imports
2021	81			-344	-81	

Source: Ministry of Commerce and Industry website, ministerial legislative decisions, Egyptian Official Gazette, various issues.

Thirdly: Partial Equilibrium Model Application for Rice Crop:

A - Partial Equilibrium Model in the Case of Government intervention:

1-Change in Government

$\triangle GR = t\,(v` - w`)$ or

$\triangle GR = ((1 - NPC) / NPC)\,(v` - w`)$

2-Change in Foreign Exchange

$\triangle FE = -\,(P^b / P^d)\,t\,(e_s\,v` - n_d\,w`)$ or

$\triangle FE = -\,((1 - NPC) / NPC^2)\,(e_s\,v` - n_d\,w`)$

3-Change in Producer Surplus

$WG_p = -\,(t\,v` + NEL_p)$ or

$WG_p = -[\,((1 - NPC) / NPC)\,v` + NEL_p]$

4-Change in Consumer Surplus

$WG_c = t\,w` - NEL_c$ or

$WG_c = ((1 - NPC) / NPC)\,w` - NEL_c$

5- Net Economic loss in Production

$NEL_p = 0.5 e_s\,t^2\,v`$ or

$NEL_p = 0.5 e_s\,((1 - NPC) / NPC)^2\,v`$

6-Net Economic loss in Consumption

$NEL_c = 0.5 n_d\,t^2\,w`$ or

$NEL_c = 0.5 n_d\,((1 - NPC) / NPC)^2\,w`$

7- Net Effect = - (NEL_p + NEL_c)

B - Partial Equilibrium Model in the Absence of GovernmentIntervention:

1-Change in Government

$\triangle GR = t`\,[v\,(1 - t`e_s) - w\,(1 - t`n_d)]$ or

$\triangle GR = (1 - NPC)\,\{v[1 - e_s\,(1 - NPC)] - w\,[1 - n_d\,(1 - NPC)]\}$

2-Change in Foreign Exchange

$\triangle FE = -\,t`(v\,e_s - w\,n_d)$ or

$\triangle FE = -\,(1 - NPC)\,(v\,e_s - w\,n_d)$

3-Change in Producer Surplus

$WG_p = -\,(t`\,v + NEL_p)$ or

$WG_p = -\,[(1 - NPC)\,v + NEL_p]$

4-Change in Consumer Surplus

$WG_c = t`\,w + NEL_c$ or

$WG_c = [(1 - NPC)\,w] + NEL_c$

5-Net Economic loss in Production

$NELp = \frac{0.5\,e_s\,t`^2}{v}$ or $NELp = \frac{0.5\,e_s\,(1 - NPC)^2}{v}$

6- Net Economic loss in Consumption

$NELc = \frac{0.5\,n_d\,t`^2\,w}{}$ or $NELc = \frac{0.5\,n_d\,(1 - NPC)^2}{w}$

7-Net Effect = - (NEL_p + NEL_c)

Where:

P^d = domestic price. P^b= boundary price,

v`= the value of domestic production at local prices.

v = value of domestic production at border prices,

w` = the value of domestic consumption at local prices.

w = the value of domestic consumption at border prices,

NPC = P^d/P^b Nominal protection coefficient.

e_s = domestic price elasticity of supply, nd = domestic price elasticity of demand.

t = tax or tariff rate, $t` = (t\,P^d / P^b)$.

Partial Equilibrium Model for Rice Crop in the Case of Government Intervention and Non-Intervention:

1 -Government Revenue Change Index for Rice Crop:

The government revenue change index is considered one of the most important indicators for measuring the partial equilibrium model, which includes measuring the change in government revenue and measuring the change in foreign currency revenue resulting from the application of price policies for the rice crop during the study period, as follows:

(a) Change in Government Revenue:

Table (8) shows a deficit in the government revenue change index in the case of Government intervention, which averaged about EGP33 thousandfor the period (2000-2021). This deficit decreases and turns into a

surplus in the case of non-intervention, with an average value of about EGP860 thousand for the same period due to the application of price policies related to the rice crop as shown in table (9). This index shows the impact of applying the rice price policy on the Government's general budget, where government revenue increases in the case of non-intervention.

(b) Change in Foreign Currency Revenue:

The revenue from foreign currency for the Government is affected by rice exports. table (8) shows a surplus in foreign currency revenue in the case of Government intervention, which is equivalent to about EGP4238 thousand on average for the study period. This means that the Government has gained this quantity in foreign currency. However, these gains decreased in the case of non-intervention to approximately EGP1547 thousandas an average for the same period. This means that the crop achieved increasing gains for the Government in the case of government intervention, as evident in table (9).

Table (8): Partial equilibrium model indicators for rice crop in the case of government intervention during the period (2000-2021). (1000 EGP)

Years	GR	FE	WGc	WGp	NELc	NELp	Net Effect
2000	41.29	107.70	630.28	-657.48	-2.61	-11.48	14.08
2001	211.76	233.19	1038.45	-1204.83	-7.59	-37.79	45.38
2002	250.60	382.94	1596.16	-1746.57	-17.31	-82.88	100.18
2003	461.71	693.03	2836.84	-3113.47	-31.84	-153.24	185.08
2004	751.90	970.40	3483.30	-3946.18	-47.87	-241.15	289.02
2005	813.23	745.88	2696.42	-3325.83	-28.75	-155.06	183.82
2006	976.81	972.45	3261.90	-3963.51	-43.08	-232.11	275.20
2007	650.84	492.29	2076.71	-2650.07	-12.04	-65.44	77.48
2008	285.66	2103.45	8402.87	-7911.40	-147.29	-629.84	777.13
2009	1931.14	6896.15	17298.08	-15842.86	-603.51	-2782.85	3386.36
2010	1310.54	2493.08	8242.14	-8637.91	-157.64	-757.13	914.77
2011	-29.26	256.58	1681.33	-1618.32	-6.67	-27.08	33.75
2012	381.65	3116.87	11563.77	-10691.17	-237.90	-1016.36	1254.25
2013	995.86	3054.86	10870.31	-10708.91	-209.68	-947.58	1157.26
2014	48.65	423.62	2590.36	-2578.07	-11.69	-49.25	60.94
2015	262.44	1483.93	6786.65	-6603.62	-84.13	-361.33	445.47
2016	31.07	4033.49	13935.75	-12136.22	-355.98	-1474.63	1830.61
2017	-1325.00	2904.83	14816.93	-12447.89	-219.43	-824.61	1044.04
2018	-577.08	3145.54	14441.27	-12715.44	-231.36	-917.39	1148.75
2019	-7986.27	10702.54	36232.51	-21009.36	-1732.86	-5504.03	7236.88
2020	959.79	34881.55	62377.71	-41366.02	-4224.28	-17747.20	21971.47
2021	-1179.07	13151.03	41890.63	-34050.28	-1328.83	-5332.44	6661.28
Average	-33.26	4238.43	12215.92	-9951.15	-442.83	-1788.68	2231.51
Maximum	1931.14	34,881.55	62,377.71	-657.48	-2.61	-11.48	21971.47
Minimum	-7986.27	107.70	630.28	-41366.02	-4224.28	-17747.20	14.08

Where: 2GR: Change in government revenue, FE: Change in foreign exchange, WG_c: Change in consumer surplus

WG_p: Change in producer surplus, NEL_c: Net economic loss in consumption, NEL_P: Net economic loss in production

Source: Calculated fromTable (II) and (III) in the appendix

2 -Welfare Indicators:

One of the partial equilibrium model indicators studied is the change in surplus between the product and the consumer of rice. For the consumer, imposing implicit taxes on exports reflects a decrease in the price of the commodity locally, which leads to a decrease in their spending and an increase in their welfare. This increase can be measured in the form of a change in consumer surplus. However, in the case of the producer, it is in a worse position because supporting the consumer is considered an implicit tax on the product, which leads to a decrease in revenue and reflects in a change in producer surplus as a result of the decrease in revenue, minus the increase in costs.

(a) Change in Consumer Surplus:

It is evident from Table (8), (9) that there is a surplus for the consumer, which quantityed to approximately EGP12216 thousand in the case of government intervention as an average for the period (2000-2021). This surplus decreased in the case of no government intervention to about EGP11628 thousand during the study period, indicating a higher surplus for the consumer in the case of government intervention.

(b) Change in Producer Surplus:

The results from Table (8), (9) showed a deficit in producer surplus in the case of government intervention, which quantityed to approximately EGP9951 thousand as an average for the study period. This deficit increased in the case of no government intervention during the same period to about EGP11148 thousand. This indicates that there is no surplus for the producer, but rather a deficit, which decreased in value in the case of government intervention.

Table (9): Partial Equilibrium Model Indicators for Rice in Caseof Non-Government Intervention of EGP for the Period (2000-2021). (1000 EGP)

Years	GR	FE	WGc	WGp	NELc	NELp	Net Effect
2000	56.11	89.95	625.49	-659.37	-2.18	-9.59	11.76
2001	256.52	172.78	1025.24	-1214.62	-5.62	-28.00	33.62
2002	336.83	251.80	1567.47	-1774.95	-11.38	-54.50	65.87
2003	619.44	450.22	2784.32	-3167.16	-20.68	-99.55	120.23
2004	984.48	583.83	3406.63	-4042.24	-28.80	-145.09	173.89
2005	980.29	493.26	2648.65	-3378.35	-19.01	-102.55	121.56
2006	1207.89	594.40	3192.48	-4053.75	-26.34	-141.87	168.21
2007	734.47	385.49	2055.25	-2664.27	-9.43	-51.24	60.67
2008	807.95	1138.36	8175.86	-8200.37	-79.71	-340.86	420.57
2009	3534.93	2537.47	16472.50	-17601.74	-222.06	-1023.96	1246.03
2010	1932.90	1294.09	8002.67	-9002.03	-81.83	-393.01	474.83
2011	5.07	215.75	1669.05	-1622.63	-5.61	-22.77	28.38
2012	1160.87	1559.95	11206.81	-11198.85	-119.06	-508.67	627.73
2013	1758.70	1579.07	10552.25	-11166.69	-108.39	-489.81	598.19
2014	110.44	348.51	2,569.04	-2586.80	-9.62	-40.52	50.14
2015	609.72	929.52	6649.81	-6738.62	-52.70	-226.34	279.04
2016	1027.39	1796.18	13421.25	-12954.17	-158.52	-656.68	815.20
2017	-618.96	1694.49	14469.50	-12791.48	-128.00	-481.02	609.03
2018	196.50	1773.48	14079.46	-13115.60	-130.44	-517.23	647.68
2019	-5759.20	3160.20	33987.99	-24888.18	-511.67	-1625.20	2136.87
2020	7035.30	7835.71	57204.50	-55126.53	-948.93	-3986.69	4935.62
2021	1952.82	5143.81	40042.05	-37297.03	-519.75	-2085.70	2605.45
Average	860.48	1546.74	11627.65	-11147.52	-145.44	-592.31	737.75
Maximum	7035.30	7835.71	57204.50	-659.37	-2.18	-9.59	4935.62
Minimum	-5759.20	89.95	625.49	-55126.53	-948.93	-3986.69	11.76

Source: Calculated from Table (II), (III) in the appendix.

3 -Efficiency Indicators:

The economic efficiency indicator is one of the most important partial equilibrium model indicators, which measures the net economic profit or loss in consumption and production and the net impact to identify the economic efficiency during the period (2000-2021).

(a) Net Economic Loss in Consumption:

By measuring the economic loss in consumption, it appears from the data in Table (8), (9) that the average net economic loss in rice consumption in the case of government intervention during the study period quantityed to about EGP443 thousand. This decreased in the case of no government intervention to about EGP145 thousand during the study period.

(b) Net Economic Loss in Production:

It is evident from Table (8), (9) that the average net economic loss in rice production in the case of government intervention during the period (2000-2021) quantityed to approximately EGP1789 thousand, which decreased to about EGP592 thousand in the case of no government intervention during the study period.

(c) Net Impact:

The data in Table (8), (9) indicate that the average net impact during the study period (2000-2021) quantityed to approximately EGP2232 thousand in the case of government intervention. This decreased to about EGP738 thousand in the case of no government intervention during the same period.

The following is a summary of the current situation of applying the pricing policy for the rice crop, indicating the advantage of government intervention in the pricing policy for rice during the period (2000-2021), as shown in table (10).

1-1Government Revenue Indicators:

(a) Change in Government Revenue:

The table (10) shows a deficit in government revenue of about EGP33 thousand on averages during the study period in case of government intervention. The deficit decreased and government revenue increased in the case of no government intervention, reaching about EGP860 thousand on averages for the period (2000-2021). Therefore, the decision here favors no government intervention in the pricing policy for rice.

(b) Change in Foreign Exchange Surplus:

The table (10) shows a surplus in foreign exchange of about EGP4238 thousand onaverage during the study period in case of government intervention. The surplus decreased in case of no government intervention, reaching about EGP1547 thousand on average for the same period. Therefore, the decision here favors government intervention in the pricing policy for rice, as it increases foreign exchange surplus.

1-2Welfare Indicators:

(a) Change in Producer Surplus:

The results of table (10) show that the average deficit in producer surplus was about EGP9951thousand in case of government intervention, and it increased in case of no government intervention, reaching about EGP11148 thousand on averages for the period (2000-2021). Therefore, the correct decision here is for government intervention, as it reduces the deficit in producer surplus.

(b) Change in Consumer Surplus:

The table (10) shows a surplus in the change in consumer surplus on average during the study period of about EGP12216 thousandin case of government intervention. The surplus decreased in case of no government intervention, reaching about EGP11628 thousand on averages for the period (2000-2021). Therefore, the decision here is for government intervention in the pricing policy for rice, as it increases consumer surplus.

1-3 Efficiency Indicators:

(a) Net Economic Loss in Production:

The table (10) shows that the average net economic loss for the rice crop during the period (2000-2021) was about EGP1789 thousand in case of government intervention. The loss decreased in case of no government intervention, reaching about EGP592 thousand on averages for the period (2000-2021). Therefore, the decision here is for no government intervention in the pricing policy for rice, as it reduces the net economic loss in production.

(b) Net Economic Loss in Consumption:

The table (10) shows that the average economic loss in rice consumption during the study period was about EGP443 thousand in case of government intervention. The loss decreased in case of no government intervention, reaching about EGP145 thousand on averages for the period (2000-2021). This indicates that the decision here is for no government intervention in the pricing policy for rice, as it reduces the net economic loss in consumption.

(c) Net Impact:

Based on the data in table (10), the net impact on society during the period (2000-2021) was about EGP2232 thousand in case of government intervention. The impact decreased in case of no government intervention, reaching about EGP738 thousand on average for the same period.

The results of applying the partial equilibrium model indicate that government intervention in rice price policy is preferable, as it increases the net impact on society.

Thus, it is clear that the best decision is for the Government to intervene in the rice price policy, as it has a positive impact on the change in foreign currency reserves, the change in producer surplus, the change in consumer surplus, and has a positive impact on the net impact index by increasing the net impact on society.

Table (10): Presents the results of the current situation of the pricing policy for rice using the partial equilibrium model.(1000 EGP)

Items	Govt. Revenue Indicators		Welfare Indicators		Efficiency Indicators		
	GR	FE	WGc	WGp	NELc	NELp	Net Effect
Govt. intervention	-33	4238	-9951	12216	-1789	-443	2232
Non-intervention of the Govt.	860	1547	-11148	11628	-592	-145	738
Decision	Non-intervention of the Govt.	Govt. intervention	Govt. intervention	Govt. intervention	Non-intervention of the Govt.	Non-intervention of the Govt.	Govt. intervention

Source: Partial equilibrium model indicators for rice crop in the case of government intervention and non-intervention during the period (2000-2021).

Summary:

The research problem is summarized in reducing the cultivated area of the crop and the resulting decrease in production, with a trend towards importing from abroad and preventing exports to provide the crop for local consumption, which has led to an increase in crop prices and the emergence of some imbalances in the domestic rice market.

Therefore, the research aimed to study the development of some production, economic, and consumption variables for the rice crop, with a study of some ministerial decisions during the study period and their impact on the path of the rice crop, in addition to studying the impact of the partial equilibrium model, which shows the impact of crop price policies on both the producer and the consumer.

The study results showed a statistically significant annual decrease in the cultivated area, production, and exports during the study period by about 21,100 feddans, 0.01 tons per feddan, 101,200 tons, and 58,600 tons, respectively.Meanwhile, the local price, consumer price, export price, total costs, and net return all increased annually by a statistically significant rate of approximately 180, 460,500, 500 and 190 EGP, respectively, during the study period.

By studying some ministerial decisions related to the area, production, and export of rice during the period (2000-2021), decision No. 122 for the year 2000 was found to support rice exports by approximately EGP200 during the period from 2000-2005, resulting in a decrease in the cultivated area and production of rice to preserve water and limit its consumption. This was followed by some decisions related to imposing fees on exports during the period from 2006 to 2008, which led to a decrease in the cultivated area and production of the crop from 2006 to 2015. Then came decision No. 722 for the year 2016, which calls for stopping the export of rice of all types, leading to a decrease in the cultivated area of rice and thus a decrease in rice production in 2017.

Starting from 2018, eight governorates were designated for rice cultivation, leading to thelowest cultivated area during the study period, estimated at about 859thousand feddans, and the lowest production, reaching about 3122 thousand tons in 2018. In decision No. 65 for the year 2019, the number of governorates designated for rice cultivation was increased to nine, which resulted in an increase in production based on considering 2018 as a baseline year, and production increased during the period from 2019 to 2021.

As for exports, the quantity exported increased during the period from 2000 to 2005 according to decision No. 122 to support exports. However, rice exports decreased from 2008 to 2016 due to the imposition of various fees on rice exports in accordance with some decisions issued during this period. In 2016, decision No. 722 was issued, which calls for stopping the export of rice of all types. In 2017, rice was imported, and as 2017 is considered a baseline year, imports decreased in 2018 due to an increase in imports in 2017.

However, imports increased again in 2019 as a result of designating eight governorates for rice

cultivation and the consequent decrease in production in 2018. But imports quickly decreased again due to an increase in production resulting from an increase in the cultivated area for the crop from eight governorates to nine governorates.

By applying the partial equilibrium model to determine the impact of price policy on rice production, it was found that there is a preference for government intervention regarding the foreign exchange revenue and surplus indicators, as well as the net effect of the model, which confirms the preference for government intervention in the price policy for rice. However, the best decision was not to intervene in the other indicators, namely government revenue, net economic loss in production and consumption.

Recommendations:

The research reached several goals, the most important of which are:

1. Planting dry rice varieties that can tolerate drought and salinity, such as Sakha 108, Sakha Super 300, in addition to Sakha 107, Sakha 101, Giza 179, and Giza 178, in order to conserve water consumption and provide water content to increase the cultivated area of the crop, which has been reduced to conserve water consumption.
2. Planting high-yielding varieties that are resistant to disease and require less water, which can tolerate salinity, such as hybrid Egypt 1, Giza 178, Giza 179, Sakha 108, and Sakha Super 300, in order to increase rice production and resist diseases and pests such as blight and rot.
3. Establishing demonstration fields and awareness programs for farmers to provide them with guidance on proper irrigation methods for the crop and methods of disease and pest control.
4. Providing sufficient quantity of modern, high-yielding varietiesthat are resistant to disease, salinity, and drought, enough to plant rice in different provinces and provide them to farmers before the planting season.
5. Directing ministerial decisions and price policies in favor of consumers to reduce the increase in the consumer price of rice, through the cultivation of water-efficient varieties and the development of high-yielding varieties.
6. Increasing the cultivated area of rice, especially in areas where water-efficient varieties that can tolerate drought and salinity are grown, such as the new innovative varieties Sakha 108 and Sakha Super 300, which are characterized by high productivity and low water consumption, reaching a quarter of the water requirement of other varieties that can tolerate salinity, whether grown in saline lands or irrigated with water containing salt.
7. Activating the role of contract farming for rice production and working to determine fair prices for receiving rice from farmers.

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Appendixes:

Table (I): Productivity indicators of thesummer rice crop

Years	Area (1000 feddans)	Productivity (ton / feddan)	Production (1000 tons)
2000	**1569**	**3.820**	**6001**
2001	**1340**	**3.900**	**5227**
2002	**1547**	**3.940**	**6105**
2003	**1508**	**4.090**	**6175**
2004	**1537**	**4.130**	**6351**
2005	**1459**	**4.200**	**6123**
2006	**1593**	**4.230**	**6744**
2007	**1673**	**4.110**	**6868**
2008	**1770**	**4.090**	**7241**
2009	**1369**	**4.030**	**5518**
2010	**1093**	**3.960**	**4327**
2011	**1409**	**4.020**	**5665**
2012	**1472**	**4.010**	**5897**
2013	**1419**	**4.030**	**5717**
2014	**1364**	**4.000**	**5461**
2015	**1216**	**3.960**	**4818**
2016	**1353**	**3.920**	**5308**
2017	**1307**	**3.790**	**4958**
2018	**859**	**3.630**	**3122**
2019	**1303**	**3.680**	**4798**
2020	**1188**	**3.740**	**4441**
2021	**1105**	**3.840**	**4242**
Average	**1384**	**3.960**	**5505**

Source: Collected and calculated from the Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Agricultural Economics Bulletin, various issues.

Table (II): Economic indicators of the rice crop (1000 EGP)

Years	Domestic price	Consumer price	Total costs	Net return	Export price
2000	0.583	1.383	1.692	0.615	0.698
2001	0.592	1.085	1.685	0.709	0.799
2002	0.672	1.548	1.760	0.983	1.022
2003	0.992	1.768	2.059	2.113	1.527
2004	1.024	2.167	2.373	1.969	1.702
2005	1.070	1.933	2.455	2.149	1.618
2006	1.077	1.193	2.658	2.029	1.762
2007	1.451	2.298	3.065	3.031	1.853
2008	1.465	3.190	3.933	2.259	2.707
2009	1.495	2.280	3.788	2.458	4.063
2010	1.837	2.670	4.073	3.430	3.539
2011	2.008	4.540	4.423	3.917	2.388
2012	2.067	4.280	4.948	3.620	4.130
2013	2.110	5.020	5.205	3.581	4.082
2014	2.130	5.110	5.465	3.364	2.589
2015	2.136	5.470	5.809	2.948	3.410
2016	2.268	6.340	6.805	2.391	5.093
2017	3.500	6.520	8.359	5.221	6.000
2018	3.552	10.300	10.475	2.758	6.300
2019	3.556	7.830	9.678	3.759	12.043
2020	3.565	8.080	10.407	3.275	15.870
2021	5.964	14.340	14.685	8.845	15.248
Average	2.051	4.516	5.264	2.974	4.480

Source: Collected and calculated from the Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Cost and Net Return Statistics Bulletin, Foreign Trade Bulletin, various issues.

Table (III): Consumption indicators of the rice crop (1000 tons)

Years	Total Production	Total Consumption	Total Exports
2000	5817	5458	360
2001	6003	4980	1030
2002	5227	4511	698
2003	6106	5243	779
2004	6176	5067	1110
2005	6352	4868	1489
2006	6125	4699	1435
2007	6755	5136	1787
2008	6877	6647	261
2009	7253	6501	836
2010	5520	4750	795
2011	4330	4407	60
2012	5675	5490	225
2013	5911	5406	529
2014	5724	5618	120
2015	5467	5261	252
2016	4818	4807	100
2017	5309	5839	0
2018	4961	5171	0
2019	3124	4065	0
2020	4804	4726	3
2021	4242	4369	4
Average	5572	5137	540

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Food Balance Bulletin, various issues.

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