THE ECONOMICS OF COTTON PRODUCTION IN IRAQ AND SOME OTHER ARAB COUNTRIES

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ABSTRACT

Human being has known cotton and used it to make clothes and other daily needs for a long time. Archaeological discoveries have indicated that cotton textiles were found buried underground in India more than three thousand years ago. Scientists in Peru in South America found samples of cotton fabrics dating back to more than 2500 years, cotton tissues were also found in the upper Nile River, southern Sudan, dating back to about 500 BC. Cotton was planted on the banks of the Tigris and Euphrates rivers at the beginning of Islam, and the spinning and weaving industry was famous throughout Iraq and was exported to the markets of the West, where it was known as "Muselleni" in relation to the city of Mosul.

Now days, the quantity of production for the year 2020 did not exceed 60 tons, with a cultivated area not exceeding 220 acres. According to the data of the Directorate of Agricultural Statistics / Crop Production Report (Cotton, Maize, Potato) in 2010, Kirkuk governorate ranked first among the governorates of Iraq in the cultivated area and the amount of production, which amounted to 72,536 dunums and 41,233 tons, respectively, which represents 88.16% of the cultivated area and 91.07% of the total production amount in Iraq.

The deterioration in production and area is attributed to many reasons, including the high costs of the requirements for cotton cultivation and its manufacture, and the lack of clear support from successive governments for farmers to continue cultivating this important cash crop. In addition, people are being reluctance to buy cotton products that are characterized by high prices and replace them with textile products similar to cotton. Imported from abroad, this is characterized by reasonable prices.

By analyzing the data on cotton production in Iraq, it was found that the area planted with this crop can be expected in the future according to the following equation:

$$Y = e^{((8.89 + (0.563 * x)))}$$

$$ln(Y) = 8.89 + (0.563 * x)$$

As for the quantity of production, it can be expected in the future according to the following equation:

$$Y = 498.806 + (-166.553 * ln(x))$$

On the Arab level, the situation is not much different from Iraq. After Egypt was at the forefront of the Arab countries producing this crop, which is known globally for its quality in terms of staple length and quality, its cultivation took a decline in terms of the cultivated area and the amount of production, so that Syria ranked first in the Arab world with 441.4 tons, followed by Sudan which ranked second in the Arab world, with 115.2 thousand tons, and Egypt ranked third with 112.2, according to the Yearbook of Arab Agricultural Statistics, Volume 38, with the continued decline in production for the coming years for the various Arab countries producing the cotton crop.

Keywords: Arab Level, Cotton Production, Muselleni, Crop Production Report, Agricultural Statistics

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INTRODUCTION

Cotton is one of the most important cash crops in the world and is generated in cash to the farmer because it is not possible to consume the YAF or its seeds directly. In addition, cotton production is an important income for the producing country, and it provides employment opportunities for a large proportion of the population. Cotton grows in warm-climate areas. The means of work are not limited to agriculture, but also to work in shops, textile factories, vegetable oils and others (Abdul Ali, 1980).

Globally, China tops the list of cotton-producing countries as it produces a quarter of the world's production, is grown in the mid-eastern region of the country near Beijing and Shanghai, as well as cotton in other countries in Asia, such as Afghanistan, Burma, India, Iran, Palestine, Pakistan, Turkmenistan, Syria, Thailand, Turkey and Uzbekistan. In the United States (Texas, California and Mississippi grow more than half of U.S. production), cotton is grown in Argentina, Brazil, Colombia, Paraguay and Peru. Central American cotton-producing countries include El Salvador, Guatemala and Nicaragua, and on the continent of Africa the main cotton-producing countries are: Chad, Egypt, Mali, South Africa, Sudan, Tanzania and Zimbabwe, in Europe cotton is grown in Greece and Spain, and Australia is an important cotton producer. D crowned four main types of cotton: American high-rise cotton, Egyptian cotton, Sea Island cotton and Asian cotton. These different species are similar in many qualities, but differ in some other characteristics such as flower color, fiber recipes and flowering time, some grow well in irrigated ground, some are 44 mm long, others are only 13 mm long, and some varieties are stronger than others, and some are pounds of machine easier than other varieties (Agricultural Research Center, 2005).

Cotton was planted on the banks of the Tigris and Euphrates rivers at the beginning of Islam in Iraq. The textile industry was famous throughout Iraq and although it was a rudimentary industry, the resulting cotton fabrics were exported to the markets of the west, where it is known as Muslini relative to the city of Mosul... The industry has been reduced by the industrial and mechanical renaissance and the roses of beautiful cotton fabrics from foreign countries at low prices, which could not stand in front of local products, so the area under cultivation of cotton in Iraq decreased and became more used for beds (Abdul Ali, 1980).

RESEARCH PROBLEM

Cotton cultivation in Iraq and some Arab countries has been experiencing various agricultural problems in terms of production, marketing and manufacturing for some time. Now, cotton cultivation requires analysis of production levels, cultivated areas and the yield of dunums for the previous period of time in order to develop a future vision for the development of its cultivation, which has a positive impact on farms in particular and on the local and national economy in general.

RESEARCH HYPOTHESES

a. There is no moral change in the area under cotton cultivation and the amount of production in Iraq over the next three years.

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b. There is no moral correlation between the area under cotton cultivation in Iraq and the amount of production.
c. There is no moral impact of time on increased cotton production in most Arab countries.

RESEARCH METHODOLOGY

The inductive experimental approach and appropriate statistical methods based on quantitative analysis of phenomena and observations have been used to describe and compare phenomena to establish certain facts.

MATERIALS AND RESEARCH METHODS

Data from the Directorate of Agricultural Statistics/Crop Production Report (Cotton, Maize, Potatoes) were used for the years 2010-2020, as well as data from the Annual Book of Arab Agricultural Statistics Volume 29-38

Study limits

Time period from 2001 to 2020.

STATISTICAL ANALYSIS

The SPSS statistical program was used to analyze data and use appropriate statistical technology as a contrast homogeneity test, "which facilitates a lot of math calculations, shortens time and effort as well as the accuracy of calculations" (Mahmoud, 2010).

HISTORY AND ECONOMIC IMPORTANCE OF COTTON

There is no evidence in the history records of when and where man discovered the usefulness of cotton and its uses in the manufacture of fabrics for clothing and clothing, and it seems that this discovery was long before history where cotton textiles could be found in the remains of cities with ancient civilizations and the oldest in history of the existence of cotton tissues that were in India. These tissues were found buried underground more than three thousand years ago... In Peru, South America, Scientists also found samples of cotton fabrics dating back more than 2,500 years, and the remains of cotton tissues were found in the upper Nile River in South Sudan, dating back to about 500 BC. Cotton is the most important fibre crop in general and when grown it is the most important cash crop on which farmers depend and is also one of the most important sources of income for many segments of the population (Al-Khash, 1980).

There have been significant changes in cotton production in the world since World War II, and production has increased steadily in Latin American countries, while in India, Pakistan and Turkey, having been produced only for domestic consumption. It has also been grown for export. There has also been further expansion in the Near East and Latin America, with a significant increase in production as a result of vertical and horizontal expansion. According to FAO statistics for 2020 (2019 statistical data), China, followed by India and the United States of America, ranks top three in cotton seed production globally at 23.5 million tons and18.5 million tons and 12.9 million tons, respectively.

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At the Arab level, Syria ranked first in the Arab world with 441.4 thousand tons, Sudan was second in the Arab world with 115.2 thousand tons, and Egypt ranked third with 112.2 thousand tons (Arab Organization for Agricultural Development, 2010).

COTTON CULTIVATION IN IRAQ

Cotton cultivation in Iraq is limited to the northern and central regions, but there is considerable scope for expanding its cultivation in the southern region because of the validity of its climatic conditions.

The most important producing provinces are as shown in Table 1.

Table 1
CULTIVATED AREA, TOTAL PRODUCTION AND AVERAGE YIELD FOR COTTON CROP FOR 2010 AT THE PROVINCIAL LEVEL

Province	Cultivated area (Dunum)	Percentage *	Total production (ton)	Percentage *	Average yield (kg)
Nineveh	53	0.06%	34	0.08%	641.5
Kirkuk	72536	88.16%	41233	91.07%	568.4
Diyala	1645	2.00%	474	1.05%	288.1
Baghdad	645	0.78%	211	0.47%	327.1
Babylon	1789	2.17%	628	1.39%	351
Karbala	11	0.01%	2	0.00%	181.8
Wasit	1043	1.27%	313	0.69%	300.1
Salads	4050	4.92%	2230	4.93%	550.6
Al , Qadisiyah	510	0.62%	153	0.34%	300
Total	82282	100%	45278	100%	550

Source: Directorate of Agricultural Statistics/Crop Production Report (Cotton, Maize, Potatoes) 2010

* Percentages calculated by the researcher

From the table above, it is clear that Kirkuk province is largest area of cotton cultivation in Iraq, which reached 88.16 percent, while the area under cultivation in Nineveh, Karbala and Baghdad governorates did not exceed 1 percent combined despite the appropriate climatic conditions of these provinces, and the amount of production of this crop in Kirkuk province is also the largest. Among the rest of the provinces, where they accounted for 91% of the production of all other provinces, which also indicates that the productivity of dunums in this province is also the largest, at 568.4 kg/dunum if we exclude Nineveh province due to limited cultivated area (only 53 dunams).

Predicting the Area under Cotton Cultivation and the Amount of Production in Iraq for the Next Three Years

The area under cultivation and the amount of production of cotton crops in Iraq varied during the period 2005-2020, with the area under cultivation decreasing from 108,000 dunams in 2005 to 60 dunams in 2020, while the amount of production varied from a decrease to a rise during the above period to only 22 tons in 2020, as shown by Table 2.

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Table 2
CULTIVATED AREA AND PRODUCTION QUANTITY OF COTTON CROP FOR 2005-2020

The year	Cultivated area (100 dunums)	Amount of production (100 tons)	Dunum yield* KG/Dunum
2005	1080	428	396.3
2006	892	375	420.4
2007	658	295	448.3
2008	306	116	379.1
2009	532	239	449.2
2010	823	453	550.4
2011	542	345	636.5
2012	655	266	406.1
2013	530	277	522.6
2014	33	14	424.2
2015	4.87	0.75	154
2016	6.97	0.84	120.5
2017	9.25	0.86	93
2018	1.32	0.37	280.3
2019	0.26	0.02	76.9
2020	0.6	0.22	366.7

Source: Directorate of Agricultural Statistics/Crop Production Report (Cotton, Maize, Potatoes) for 2010-2020.

There are several statistical methods for predicting the area and quantity of production of the cotton crop in Iraq provided by the SPSS statistical program (Linear, Logarithmic, Quadratic, Cubic, Growth) and when indicating these methods. It turns out that growth gave the least standard error compared to other methods of space

Growth Model whose equation is

$$Y = e\hat{}(b0 + (b1 * x))$$

The amount of production was logarithmic; Logarithmic. Model whose equation is

$$Y = b0 + (b1 * ln(x)).$$

The results of the cultivated area were as in table 3:

Table 3
PREDICTING THE AREA UNDER COTTON CULTIVATION IN IRAQ

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	itself.
	B	Std. Error	Beta		
x	-0.563	0.07	-0.906	-8.018	0
(Constant)	8.89	0.679		13.099	0
The dependent variable is ln(area).					

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Thus, the average area under cultivation of cotton crops for the next three years is (51,29,17) dunums, respectively. The amount of cotton crop production in Iraqis as follows:

Table 4
PREDICTING THE AMOUNT OF PRODUCTION OF COTTON CROPS IN IRAQ

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	itself.
	B	Std. Error	Beta		
ln(X)	-168.553	38.52	-0.76	-4.376	0.001
(Constant)	498.806	79.492		6.275	0
The dependent variable is ln (cultivation amount).					

The predicted cotton crop production rate for the next three years is 2.5, 11.6, 21.3 tons, respectively. This negates the hypothesis that there will be no change in the area under cotton cultivation and the amount of production in Iraq in the coming years, as the results obtained from the analysis of data on the area and production of the cotton crop in Iraq show that both the area under cultivation and the amount of production are constantly decreasing over the coming years.

When examining the link between the area under cotton cultivation and the amount of production in Iraq, its data were analyzed using the SPSS statistical program, and a strong correlation was found between them, as shown by Table 5:

Table 5
LINK TO COTTON CULTIVATION AREA AND QUANTITY OF PRODUCTION

Correlations			
		Area	Amount of production
Area	Pearson Correlation	1	.974**
	Sig. (2-tailed)		0
	n	16	16
Amount of production	Pearson Correlation	.974**	1
	Sig. (2-tailed)	0.007	
	n	16	16
**. Correlation is significant at the 0.01 level (2-tailed).			

From the table above, it is clear that the correlation coefficient was 0.974, which indicates that it is morally significant below the level (0.01), so we reject the hypothesis of nothingness: the lack of a moral correlation between the area planted with cotton in Iraq and the amount of production is below the level (0.05).

Cotton Production in Some Arab Countries

As for the Arab countries, Syria and Egypt remain at the forefront of the Arab countries producing this crop and Iraq continues to suffer from a shortage of cotton production, especially in recent times, and what is produced locally constitutes only a small percentage of the production of other Arab countries and the country's actual need due to the high production costs and the need for large manpower not to enter the mechanization in its harvest, as table 6 shows cotton production in some Arab countries. From the previous table, it is clear that Syria's cotton

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production accounts for more than 63% of the production of the rest of the Arab countries, followed by Sudan with 16.69%, Iraq's production is less than 1% and ranks eighth among Arab cotton-producing countries.

Table 6
QUANTITY OF COTTON CROP PRODUCTION FOR 2017 IN SOME ARAB COUNTRIES

State	Average production (1000 tons)	Percentage *
Tunisia	1.46	0.21%
Sudan	115.2	16.69%
Syria	441.44	63.95%
Somalia	7.22	1.05%
Iraq	0.09	0.01%
Egypt	112.22	16.26%
Morocco	0.3	0.04%
Yemen	12.3	1.78%
Algeria	0.08	0.01%
Total	690.31	100.00%

Source: Arab Agricultural Statistics Yearbook Volume 38

* Percentages were calculated by the researcher.

especially in recent times, and what is produced locally constitutes only a small percentage of the production of other Arab countries and the country's actual need due to the high production costs and the need for large manpower not to enter the mechanization in its harvest, as table 6 shows cotton production in some Arab countries. From the previous table, it is clear that Syria's cotton production accounts for more than 63% of the production of the rest of the Arab countries, followed by Sudan with 16.69%, Iraq's production is less than 1% and ranks eighth among Arab cotton-producing countries.

Development of Cotton Production in Some Arab Countries

Cotton production is constantly declining in many Arab producing countries during the early years of the third millennium, as shown in table 7:

Table 7
COTTON PRODUCTION (1000 TONS) IN SOME ARAB COUNTRIES FOR THE PERIOD 2001-2008

State	2001-2004	2005-2009	2010-2013	2014-2017
Tunisia	2.75	2.5	1.2	1.46
Sudan	16.87	193.65	90.45	123.95
Syria	610.92	506.37	266.61	282.59
Somalia	0.38	2.39	4.58	5.72
Iraq	50.5	21.08	24.75	23.82
Egypt	411.21	296.27	187.64	107.24
Morocco	0.53	0.32	0.15	0.21
Yemen	16.93	14.68	14.82	13.83
Sentence	1110.09	1037.26	590.19	558.8

Source: Arab Agricultural Statistics Yearbook Volumes 29-38

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From the table above, it is clear that cotton production in all Arab countries is declining continuously if we exclude Somalia, which indicates a rise in production during the years of study.

In order to identify the development of cotton production in these Arab countries for the coming years, the SPSS statistical program has been used to find out the best formulas through which cotton production can be expected in the future in each Arab country through the regression equation for each of them, showing that the logarithmic equation has the following formula:

$$Y = b0 + (b1 * ln(x))$$

It is the best because it has the least standard error (Std. Error of the Estimate), and in general the regression equation parameters for total cotton production for Arab countries were as follows:

Table 8
PARAMETERS EQUIVALENT REGRESSION FOR TOTAL COTTON PRODUCTION IN ARAB COUNTRIES: COEFFICIENTS

	Unstandardized Coefficients		Standardized Coefficients	t	itself
	B	Std. Error	Beta		
ln(time period)	-439.797	140	-0.912	-3.141	0.088
(Constant)	1173.563	132.985		8.825	0.013

Through previous dependents, cotton production in the next four years will be (465.74) thousand tons and it will last only a few times until cotton production stops in some Arab countries, especially in Somalia, Morocco and Iraq.

CONCLUSION

1- Cotton cultivation in Iraq is limited to only nine provinces, and the area under cultivation has varied from 72,536 dunums in Kirkuk province to only 11 dunums in Karbala province, according to 2010 data.

In 2010, the dunum yield for cotton yields was only at its highest level (641.5 kg/dunum) in Nineveh province, and in the lowest levels in Karbala province (181.8 kg/dunum) accompanied by a small area under cultivation despite the possibility of expanding the cultivation of this crop.

2- The area under cotton cultivation in Iraq is constantly decreasing over time according to the following regression equation:

$$Y1 = e^{(8.89-0.503*X1)}$$

Y1: Cotton-grown area

X1: Time

3- The amount of cotton production in Iraq is constantly declining over time according to the following regression equation:

Y2= 498.806-168.553Ln(X2)

Y2: Amount of cotton production

4- There is a morally significant correlation between the area under cultivation and the amount of cotton production amounting to (0.974).

5- There is a continuing increase in dunum yields during the study period-except in 2008 and 2009-in general.

6- At the Arab level, Syria ranks first among Arab countries and will continue for at least the next few years, followed by Sudan.

7- Total cotton production in the Arab countries will remain unstable, fluctuating between increase and decrease, tending to decline steadily.

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RECOMMENDATIONS

1- A program has been developed by the Ministry of Agriculture to introduce cotton cultivation in provinces that do not yet grow cotton and encourages farmers in cotton-growing provinces to expand their cultivated areas.
2- Iraqi university agricultural colleges are conducting research to find highly productive cotton varieties suitable for weather conditions and water scarcity in Iraq.
3- The Ministry of Industry is revitalizing cotton-based industries, whether seeds or Yafa, in order to motivate farmers to expand the production of this crop.
4- Setting rewarding prices for cotton crops by stakeholders to suit the efforts made and the amounts spent in its production.
5- Import machinery and equipment to harvest this crop to reduce loss and time as a result of the manual genie currently approved.
6- Exchange experiences with Arab cotton crop producers such as Syria and Egypt in order to improve the cultivation of this crop.
7- The establishment of an Arab organization dealing with the cultivation, production and manufacture of cotton crop products.

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