



# AN ECONOMIC STUDY OF THE PRODUCTION AND CONSUMPTION OF DATES IN IRAQ AND ITS IMPACT ON IMPROVING THE EFFICIENCY OF THE USE OF ECONOMIC RESOURCES

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Article history:	Abstract:
<b>Received:</b> 14 <sup>th</sup> February 2025 <b>Accepted:</b> 11 <sup>th</sup> March 2025	The production of dates is a source of food and raw materials for many manufacturing industries, making them important crops in terms of food and economy and their role in increasing the efficiency of the use of economic resources. The agricultural sector in Iraq is one of the major sources for the provision of raw materials in many manufacturing industries. The study used a longitudinal data collection method to investigate some of the factors influencing the production of date varieties grown in Iraq. The proper model for the nature of these data was adopted, and an analysis of the integration of the variables included in the study was carried out in order to meet the research's goals. The most significant of the research's findings was that, despite not reaching the level of ambition, date production is still progressing. Since the price of dates is a significant factor that influences their production, price fluctuations are the cause of this slow development. Thus, the study suggested that in order to incentivize farmers to boost production and establish export channels to enable the export of excess overseas, a fixed price level for this crop should be maintained.

**Keywords:** Date production, Date consumption, Efficiency of economic resource use

## INTRODUCTION

Compared to other producing nations, Iraq produces a large number of uncommon varieties of dates, making it one of the world's leading producers. Iraq is unique of the nations with a comparative benefit in the cultivation and manufacture of dates, hence its production is extremely important economically. Date output has, however, generally declined in recent years due to a sharp reduction in the number of date palm plants. Iraq's poor agricultural strategies and goals, as well as the country's political climate, are some of the causes of this deterioration. Farmers' disinterest in date production has been influenced by a number of factors, including poor date marketing, a lack of an enlarged marketing body, insufficient distribution to manufacturers that use dates as a uncooked physical, and the inability to develop international marketplaces for date exports. The crop has become economically unrewarding, prompting this study to identify the problems and obstacles hindering date production and the declining number of palm trees in Iraq.

## PART ONE: RESEARCH METHODOLOGY

### 1. Research Problem

The problem of the research is the decline in the production and productivity of dates and the decline in the number of palms in recent years, which is due to a set of challenges facing the date production sector, acting as an obstacle to its development, particularly the fluctuations in the prices of dates at local and export outlets and the impact of the importer on the local production of the Iraqi dates product.

### 2. Objectives of Research

The current research aims to study the issues moving the manufacture of dates in Iraq, as well as to examine the realism of manufacture and its growth and development rates of manufacture and output, along with the number of palm trees. It will then analyse the factors affecting the production of dates and identify the actual details that have led to the decline in manufacture, followed by the reduction in the contribution of date production to the agrarian GDP and its impact on improving efficiency of the use of economic resources.

### 3. Hypothesis of Research

The research is based on the following hypothesis: The production of dates was affected by a set of factors that led to a decrease in the number of palm trees and subsequently reflected on the decrease in the production and marketing of dates, thereby affecting the efficiency of the use of economic resources.



#### 4. Research Method

Two methods of analysis have been adopted in order to achieve the objects of the research; the first is the descriptive method, which includes the description of the most important variables adopted by the study and the description of the varieties, and the second is the quantitative method by selecting the best arithmetical method to express the outstanding and targeted.

### PART TWO: THE THEORETICAL ASPECT OF THE RESEARCH

#### 1. The Economic Importance of Dates

Dates are a foodstuff through direct consumption and are used in many manufacturing industries, and Iraq had the widest land planted with palm trees until the eighties of the last century, and more than 600 varieties of dates are spread in Iraq, most of which are of commercial importance for the annual production intensity (Oweida, 2016: 2), and for this dates can play a major role in the national economy by contributing to meeting the food needs of consumers and exporting the surplus abroad for human consumption and various industrial uses and animal feed. (Miguel, 2006:22) Many researchers have been interested in the date crop due to the importance of this crop in nutritional and economic terms. He pointed out (Al-Saadi and Al-Musawi, 2009: 4) in their study on the function of the supply of dates to the need to use the optimal combination of palm cultivation and date production in the province of Basra through the flexibility of factors affecting the production function, and recommended researchers to support the agricultural sector in general and palm cultivation in particular and protect this crop from extinction and the expansion of cities and try to dig rivers buried previously. He also aimed (Arida and Shalouf, 2015: 16) to identify the most important factors affecting the production of the date crop in the study sample in the "Wadi Al-Shati" district in Libya by estimating the indicators of economic efficiency of the resources used in order to measure the impact of each element of the elements used in the manufacture of days on the volume of manufacture and recommended the researcher the need to educate farmers to rationalise the use of chemical fertilisers and pay attention to manure spraying operations and work to increase palm productivity. (Gujarati, 2011: 36). What distinguishes our research on the various studies of dates is our reliance on a new methodology to examine the reality of dates in Iraq, and this methodology yields more accurate results, allowing for better and healthier planning based on these results by identifying factors that can influence the marketing process of this product.

#### 2. The Reality of Dates Production in Iraq for the Period 2002-2020

Iraq for palm cultivation is one of the most suitable geographical areas due to the appropriate environmental conditions for palm cultivation in Iraq, which is characterised by high temperatures and low humidity in the central and southern regions of Iraq, in which dates cultivation is good (Oweida, 2016: 1). In order to study the reality of date production in Iraq for the period from 2002-2020, it is necessary to study the number of palm trees by varieties, as well as to study the quantities of date production by varieties, the rate of palm productivity by varieties, and the prices of dates by varieties in Iraq for the period from 2002-2020, as explained in the following paragraphs:

##### 2.1 Numbers of Palm Trees by Varieties in Iraq (Palm Tree) for the Period (2011-2020)

The number of palm trees fluctuated during the period studied, and this fluctuation varied from one variety to another. However, in general, the number of palm trees began to decline for all varieties after 2004. This decrease in the number of palms is attributed to various reasons, many of which are political, including urbanisation, and some are due to the conversion of agricultural land to non-agricultural (residential) use, which led to the bulldozing of many palms (Khatto, 2016: 14). Additionally, there are reasons related to agricultural pests that affected the palm, resulting in the destruction of many palm trees (Nikolas, 2011: 8). After 2014, the situation of palm cultivation and preparation improved due to enhanced pest prevention methods and the cessation of certain legislation regarding the conversion of agricultural land to other uses (Al-Khafaji, 2018: 23). To illustrate this fluctuation in the number of date palms, we present the following table:

Table (1) Numbers of Palm Trees by Varieties in Iraq (Palm Tree) for the Period (2011-2020)

Year	Al-Zuhdi	Al-Khastawy	Al-Khadhray	Al-Sayer	Al-Halawy	Other types
2011	4758000	1031000	451000	359000	370000	1495000
2012	4872000	1055000	469000	406000	383000	1726000
2013	4919000	1083000	485000	470000	398000	2198000
2014	6104479	1522920	738652	1551932	662151	4507805
2015	5569013	1470277	746989	1641333	597782	3760647
2016	5509730	1469090	767029	1697645	613031	3965333
2017	5579226	1488707	787078	1657137	569594	3794266

2018	5650546	1539693	782610	1395959	577640	3583424
2019	5571435	1533202	778654	1455567	587654	3657846
2020	5324408	1544987	782409	1564973	589762	3665344
Mean	5385784	1373788	678842.1	1219955	534861.4	3235367

**Source:** Ministry of Planning, Central Bureau of Statistics, Directorate of Agricultural Statistics, reports on the production and prices of dates for the years of study.

It is clear from the above table that the average number of palm trees by varieties Zuhdi, Khastawi, Khadrawi, Sayer, Halawi and other varieties (5,385,784), (1,373,788), (678,842.1), (1,219,955), (534,861.4), (3,235,367) palm respectively, and it is evident that Zuhdi has ranked first among the varieties of dates, while Al-Halawi has ranked last among these varieties. It is noted through this table that the amount of palm trees was consistently cumulative throughout the years of study owing to the development of the status of palm cultivation and its numbers as a result of the enhancement of pest prevention methods, in addition to the suspension of certain legislation regarding the conversion of agricultural land to other forms.

## 2.2 Quantities of Dates Production by Varieties in Iraq (Tons) for the Period (2011-2020)

The fluctuation in the number of date palms leads to fluctuations in the production of dates, and Iraq is characterised by the abundance of date varieties, all of which suit the tastes of consumers and manufacturers (Sahn, 2016: 232), and the production of dates during the period surveyed was characterised by an increase, as shown in the following table:

Table (2) Quantities of Dates Production by Varieties in Iraq (Tons) for the Period (2011-2020)

Year	Al-Zuhdi	Al-Khastawy	Al-Khadrawy	Al-Sayer	Al-Halawy	Other types
2011	37205	6819	2732	2154	2361	9082
2012	37616	7149	2914	2465	2418	11000
2013	36872	7149	2850	2541	2395	13336
2014	36064	7715	2971	2582	2372	12214
2015	33198	6212	2993	2492	1860	11114
2016	333161	64506	30833	25310	18206	119062
2017	338257	66668	31416	25582	16035	116191
2018	351558	68415	34505	26625	16368	122477
2019	365767	68834	35640	27652	17654	124887
2020	376752	69087	36542	27843	17876	127453
Mean	194645	37255.4	18339.6	14524.6	9754.5	66681.6

**Source:** Ministry of Planning, Central Bureau of Statistics, Directorate of Agricultural Statistics, reports on the production and prices of dates for the years of study.

It is clear from the above table that the average quantities of date production by the varieties Zuhdi, Khastawi, Khadrawi, Sayer, Halawi, and other varieties are (194645), (37255.4), (18339.6), (14524.6), (9754.5), and (66681.6) tons respectively. It has been established that all varieties exhibited positive growth rates, and this increase in production resulted from the rise in the number of palms produced, alongside the agriculturalists' attention in this cultivation, the development of the status of palm trees and their numbers, as well as enhancements in pest prevention methods.

## 2.3 Palm productivity rate according to varieties in Iraq (kg/dinar) for the period (2011-2020) -

The productivity of the palm depends on a group of factors, including the variety, insect infestation and other factors (Pardon, 2001: 34), and farmers and researchers consistently strive to enhance the productivity of the palm to address the ongoing dredging operations until the production shortfall is compensated (Abdul Wafi, 2010: 19). The rate of palm productivity can be clarified according to varieties in Iraq (kg / dinars) for the period (2011-2020) as shown in the following table:

Table (3) Palm productivity rate according to varieties in Iraq (kg/dinar) for the period (2011-2020)

Year	Al-Zuhdi	Al-Khastawy	Al-Khadrawy	Al-Sayer	Al-Halawy	Other types
2011	37205	6819	2732	2154	2361	9082
2012	37616	7149	2914	2465	2418	11000
2013	36872	7149	2850	2541	2395	13336
2014	36064	7715	2971	2582	2372	12214

2015	33198	6212	2993	2492	1860	11114
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**Source:** Ministry of Planning, Central Bureau of Statistics, Directorate of Agricultural Statistics, reports on the production and prices of dates for the years of study.

It is clear from the above table that the rate of productivity of the palm by varieties Zuhdi and Khastawi, Khadrawi and Sayer, and Halawi and other varieties (62.61), (48.93), (55.86), (57.08), (64.09), (73.05) respectively, and although the growth rates are not at the required level, this growth in productivity per palm continues during the period. This indicates a continued increase in domestic product, assuming the constancy of the refined area and that here is a substance, which is the continuous development in the amount of palms.

#### 2.4 Date prices according to varieties in Iraq (dinar) for the period (2011-2020) -

Due to the presence of many varieties of dates, the prices of each type of date are different, and it is noted during the studied period that the prices of each row differ from other varieties for several reasons, including the quality of the product in addition to the needs and desires of consumers towards each of the varieties (Attia, 2000: 14), and the prices of dates can be clarified according to varieties in Iraq (dinars) for the period (2011-2020) through the following table:

Table (4) Date prices according to varieties in Iraq (dinar) for the period (2011-2020)

Year	Al-Zuhdi	Al-Khastawy	Al-Khadhrawy	Al-Sayer	Al-Halawy	Other types
2011	785	925	640	690	601	395
2012	825	935	655	702	619	408
2013	850	940	671	718	638	423
2014	1040	831	684	801	751	418
2015	1112	837	700	810	766	425
2016	1235	980	865	869	698	455
2017	1242	905	922	893	757	455
2018	1219	854	994	901	759	430
2019	1245	815	819	934	788	513
2020	1223	877	997	956	826	548
Mean	1077.6	889.9	794.7	827.4	720.3	447

**Source:** Ministry of Planning, Central Bureau of Statistics, Directorate of Agricultural Statistics, reports on the production and prices of dates for the years of study.

It is clear from the above table that the average prices of dates according to the varieties of Zuhdi, Khastawi, Khadrawi, Sayer, Halawi and other varieties (1077.6), (889.9), (794.7), (827.4), (720.3), (447) dinars respectively. It is noted through this table that the Zuhdi variety has achieved the highest average of (1077.6) dinars compared to other date varieties, and the reason for this is due to the high quality of this variety, in addition to the increase in consumer desire for this variety and the increase in demand for it.

After studying the reality of date production in Iraq for the period from 2002-2020 with regard to the number of palms, the quantities of date production, the rate of palm productivity and the prices of dates in Iraq for the period from 2002-2020, it is necessary to study these variables (palm numbers, production quantities, palm productivity rate, date prices) that directly affect date production significantly, and in order to reach real and accurate calculations, it was necessary to find a standard methodology commensurate with the nature of the data adopted in the research, and this is what will be addressed in the next part of this research.

### PART THREE: THE PRACTICAL ASPECT OF THE RESEARCH

#### 3.1 Developing the study model and analyzing the influence of its variables

Since time series analysis plays a significant and significant role in providing information about the fundamental components of a particular phenomenon, it is necessary to use time series analysis for the period 2011 to 2020 in order

to formulate the research model and analyze the impact between its variables. The standard model that can be used to analyze the current research is as follows:

$$y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + e$$

Where:

$y$ : Dependent variable represented by marketing dates in Iraq.

$x_1$ : Independent variable related to the number of palm trees in Iraq.

$x_2$ : Independent variable related to the quantities of date production in Iraq.

$x_3$ : Independent variable related to the palm productivity rate in Iraq.

$x_4$ : Independent variable related to the prices of dates in Iraq.

$a_0$ : Fixed section.

$a_{1,2,...,n}$ : Estimated parameters.

$e$ : Random error term.

It is possible to express the research variables in logarithmic form, but it is important to make sure that none of them have negative values. As a result, the Semi-Log model will be employed, as follows:

$$\log y = a_0 + a_1 \log x_1 + a_2 \log x_2 + a_3 \log x_3 + a_4 \log x_4 + e$$

### 3.2 Standard analysis to analyze the factors affecting the marketing of dates in Iraq -

In order to test the appropriate standard model, a number of preparatory diagnostic tests must be carried out before beginning the standard analysis. The joint integration test, the time lag test, and the unit root test are the most important of these tests. The unit root test for the remaining time series and their level of integration will be the focus of this inquiry.

To ensure that the correlation between the research variables is real, the time series' stationarity will be evaluated. One of the most important tests for addressing this problem is the Phillips-Perron test, which assesses the stationarity of the time series by looking at the null hypothesis ( $H_0$ ), which involves the existence of a unit root. The results of the standard analysis of the variables under study can be shown using the unit root test. The results of the unit root test (Phillips-Perron test) for the research variables are shown in the following table:

Table (5) Results of the unit root test for the research variables

The Results	Table Value at the Level of Significance			Value of T Calculated	The Variables
	10%	5%	1%		
The Level	3.995	3.975	2.122	1.655	$\log y$
The First Difference	3.546	3.567	3.145	4.438	
The Level	3.367	3.233	2.215	1.215	$\log x_1$
The First Difference	3.126	3.347	3.678	4.635	
The Level	3.247	3.474	2.231	2.223	$\log x_2$
The First Difference	3.438	3.358	3.785	5.909	
The Level	3.707	3.098	2.435	2.118	$\log x_3$
The First Difference	3.133	3.476	3.745	4.549	
The Level	3.348	3.214	2.332	2.224	$\log x_4$
The First Difference	3.713	3.008	3.114	4.675	

**Source:** Prepared by the researcher based on the results of the (Eview-9) methodology.

In order to verify that there is a long-term equilibrium relationship between the research variables, the results of the standard model can be estimated after testing the joint integration between the research variables. As can be seen from the above table, all of the time series of the research variables are not stationary at the level, but they became stationary after taking the first difference at a significance level of 1%, Therefore, a joint integration test between these variables must be performed. A series of tests are used to measure the integration between the research variables, and the Johansen-Gisels test is the most crucial of these tests. Two crucial tests must be performed in order to perform this test, and they are as follows:

First: Impact Test: The null hypothesis, which states that ( $n$ ) the number of unique joint integration vectors is less than or equal to the number ( $q$ ) of the alternative hypothesis ( $r=q$ ), is tested in this test to demonstrate the influence between the study variables. It is computed using the following formula:



$$\cdot \text{Trace}(r) = T \sum_{i=r+1}^p \ln(1 - \lambda_i)$$

Where is:

T: signifies the sample size

r: the quantity of co-integration courses.

The null hypothesis asserts that there exist a number of co-integration vectors equal to at least (r), that is, the number of vectors is less than or equal to (r) that will be regarded as variables during the current investigation, where (r) is the smallest value of the eigenvectors (p-r).

**Second:** Maximum value test: The following formula is used to calculate this test:

$$\cdot \text{Max}(r, r+1) = T \sum_{i=r+1}^p \ln(1 - \lambda_i)$$

The alternative theory that there are (r+1) co-integration vectors is compared to the null hypothesis that there are (r) co-integration courses. We reject the null hypothesis that there is no co-integration vector if the calculated value of the likelihood ratio (LR) is greater than the critical value at a particular level of significance. The null hypothesis that there is at least one co-integration vector cannot be rejected if it is less. The time series are integrated to the first degree, or (1)I or higher, if they are not stationary at the level. A long-term relationship between the research variables may arise from co-integration between the two series, which generally indicates that they move together over time. The following table provides an explanation of the co-integration examination (Johansen-Geissels test) results between variables in relation to the impact and supreme worth examinations:

Table (6) Findings from the study variables' joint integration test

Hypothesized	Trace Test	Max Test
No. of CE(s) Eigenvalue	0.05 Trace Critical Value	0.05 Eigenvalue Critical Vale
$r = 0$ * None 0.574	68.772 70.615	24.332 36.237
At most 1r = 1 0.426	56.634 42.214	14.314 16.226
At most 2r = 2 0.225	20.887 18.325	11.348 10.501
At most 3r = 3 0.145	14.233 10.125	9.274 9.690
At most 4r = 4 0.098	8.056 6.443	8.225 7.128

**Source:** Prepared by the researcher based on the results of the (Eview-9) methodology.

The Johansen test results for cointegration using the greatest likelihood function are displayed in the above table. A constant and a predetermined linear trend were present when the findings were estimated. It is evident from the aforementioned results that there is only one cointegration equation present because the computed values for the impact statistic test and the maximum Eigen value were both higher than their critical values at a significance level of 5%. The following table illustrates how the autoregressive model for the lag periods spread across the research years can be used to predict the elasticities over the long term:

Table (7) Results of elasticities in Long-term research variables

The Variables	Co. Efficient	Std. Error	T. Statistic	Prob.
$\text{Log}x_1$	1.326	0.134	5.516	0.018
$\text{Log}x_2$	1.438	0.120	3.428	0.033
$\text{Log}x_3$	1.113	0.223	4.648	0.024
$\text{Log}x_4$	1.605	0.215	3.229	0.012
C	0.946	0.173	4.205	0.028
Squared	0.825	Mean Dependent Var. S.D. Dependent Var. Information Criterion Hennery Criterion		0.245
Adjusted Squared	0.681			0.312
S.E. of Regression	0.009			4.632
Log Likelihood	1.774			2.774
Statistics	-			2533.048
Prob. (Statistics)	-			0.000

**Source:** Prepared by the researcher based on the results of the (Eview-9) methodology.

According to the aforementioned table, there is a relationship between the research variables, i.e., joint auditing techniques will improve the caliber of financial reports. The following equation provides an explanation of the relationship between the research variables:

$$\log y = 0.946 + 1.326\log + 0.738\log + 1.113\log + 1.605\log + 0$$

The results presented in Table (7) indicate that all independent research variables are acceptable at a significance level of 5%. Additionally, the regression coefficient (R<sup>2</sup>) reached 0.825, indicating that 82.5% of the changes in the dependent variable (date marketing) can be explained by the independent variables (factors affecting date marketing). The preceding table showing the long-term elasticities of the research variables provides a set of data related to these elasticities, which can be explained by the following:

1. Increased marketing of dates will result from a 1% upsurge in the number of fruitful palm trees of different types in Iraq.
2. The marketing of Iraqi dates can rise by 1.438% if the country's production of dates is increased by 1%.
3. The marketing of Iraqi dates of different types will rise by 1.113 percent if the output rate of the palm tree in Iraq is increased by 1%.
4. The marketing of dates will increase by 1.605% if the selling prices of dates in Iraq are lowered by 1%. As a result, it can be concluded that all of the issues stated in this study—the number of palm trees, the amount of dates produced, the palm productivity rate, and the selling prices of dates—can have an impact on the marketing of Iraqi dates, though in different proportions. For example, it has been observed that lowering the selling prices of Iraqi dates by 1% will result in a 1.605% increase in the marketing of these dates.

## **PART FOUR: CONCLUSIONS AND RECOMMENDATIONS**

### **4.1 Conclusions**

1. Throughout the study years, the amount of palm trees increased steadily as a result of advancements in pest control techniques and palm cultivation conditions.
2. In adding to the agriculturalists' attention in this farming and the improvement of its circumstances, the number of productive palm trees increased, resulting in positive growth rates for all date varieties.
3. The steadily increasing number of palm trees is one of the contributing factors to the dates' subpar productivity rates, which are caused by the stability of the cultivated area. Furthermore, farmers react strongly to changes in agricultural prices, particularly those of dates, because the price of dates is directly correlated with production.
4. The marketing of Iraqi dates can be influenced by the number of tribute trees, the quantity of days produced, the rate of palm productivity, and the selling prices of dates. However, the impact varies, as it is observed that lowering the vending fees of dates in Iraq will result in a rise in date marketing.

### **4.2 Recommendations**

1. Laws pertaining to the conversion of various types of lands as well as regulations that would shield palm trees from erosion must be passed immediately.
2. To make the local price equal to the worldwide price, open export outlets and facilitate the export of dates overseas. Farmers will be encouraged to expand their local production as a result.
3. Increase the number of palm trees, enhance the state of palm cultivation, and develop better strategies for controlling insects and preventing pests.
4. Give palm fields the support they require in order to use contemporary control techniques to fight insects and pests that harm palm trees.

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