

THE IMPACT OF PRODUCTIVITY AND SPACE ON THE PRODUCTION OF POTATOES IN IRAQ

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ABSTRACT: *The potato crop of major vegetables in terms of production and productivity of its importance as a energy-rich and contains important nutrients, it is considered the main food of many countries, as well as economic and manufacturing and its importance as a raw material for many of the food industry. Search the cultivated area, production and productivity of dunam of the five provinces which is famous for the cultivation of potatoes and is focused (Nineveh, Baghdad, Unbar, Babel, Waist.), Agriculture for Autum and spring the years (2000-2012). Appeared through research that potato production has suffered from volatility during the Search, which was reflected in the per capita share of the domestic product and make that quota is weak and it turned out that the highest share of potatoes was in 2005 and amounted to (33.7) kg per year and less per capita was in 2010 and amounted to (6.3 kg). Was either above area planted crop was in 2005 and amounted to (203 729) donum the lowest area was planted in 2008 and amounted to (132 034) donum, The highest production was in 2005 and amounted to (807 586 tonnes) and the lowest production was in 2010 and amounted to (204 597 tons) , The productivity of the crop was dunam other volatile after reaching its highest productivity in 2002 ,was (4609) kg / donums and the least in 2008 and was the (2642) kg / dunam. According to economic theory, which shows that (97%) of changes (R²) as the value of the coefficient of determination in productivity was due to the factors involved in the specimen, and the (12%) of which are due to other factors not included in the specimen, including the chance and randomness. Search as explained through a statistical model for the production of potatoes as explained in accordance with the multiple linear regression equation that yields dunam only the area of affecting and a large degree in production, show that the effect of space on the larger output from the impact of productivity either spatial location (province and time) did not have clear role in influencing on production. Search through model statistician for the production of potatoes as explained in accordance with the multiple linear regression equation that yields dunam only the area of affecting and a large degree in production, show that the effect of space on the larger output from the impact of productivity either spatial location (province and time) did not have clear role in influencing on production.*

KEYWORDS: Productivity, Potato Production, Statistical Analysis Dunam

INTRODUCTION

The potato crop of important crops global, it is grown in more than 140 countries from around the world, and is one of the most important vegetable crops in the Arab world and a large number of countries around the world. Therefore, we find that the area planted potatoes in the world of more than 20 million hectares. Global production up to more than 300 million tons (A)

China is one of the largest potato-producing countries, where a third of the amount produced in the world are harvested in China and India.

Consumes the individual through the normal diet of about 33 kg of potatoes per year) what the potato crop is still a staple crops where per capita is still the highest in the world. But the most advanced and fastest change in the current period occurred in Southeast Asia. China is now the country's largest potato producer in the world and about a third of the world's potatoes are harvested in China and India. Concentrated grown in Iraq in the provinces (of Nineveh, Baghdad, Anbar, Babil, Wasit (1)

Unit area of potatoes dry matter and protein produces more than it produced a similar area of major grain crops that the world depends on its food, but the man needs to be consumed potatoes three times the consumption of grain in order to receive the same number of calories because of the low dry matter in potatoes. Table (1) a comparison between the potato and the main food crops in the world in terms the amount of dry matter and protein produced per unit area. The ratio between the starch in potato tubers from 12.4% to 17.8% depending on cultivar and conditions of the production of sugars ratio ranges from 0.2 to 6.8%

Problem of Search

Retreat of Cultivated area and productivity dunam and production of potato crop in Iraq for the period specified in the search, so the problem of the research is limited to knowing the impact of variables or production space and affecting crop production.

Research Aim

The research aims to determine the impact of productivity and space on the production of potatoes for the period (2000-2012), as well as the knowledge of the individual's share of potatoes, compared to the global share.

Research Method and Data Sources

Analysis method based on the use of some simplified mathematical models, including multiple regression analysis and the rate of growth and some statistical methods simplified. The data sources are Central Organization for Statistics, Ministry of Agriculture, Research and messages related to.

Research Hypothesis

Space and productivity effect on the production of potatoes in Iraq.

Table 1: Comparison of potatoes and other food crops

Crop	The quantity produced (tons / ha)	
	dry matter	protein
Wheat	1.30	0.156
Rice	1.97	0.172
Corn	2.13	0.224
Potatoes	2.93	0.266

Potatoes today at the forefront of the main food in the world, even called some of the "second bread" (and makes them many food products such as potato chips). The remnants of potato tubers from the peel and pulp resulting from starch is used in livestock feed as a supplement to other diets and intervention tubers of potatoes second-class in many of the industrial importance products industry such as starch and glucose with widespread use in the food industry, and lactic acid, which is used in pickles, as well as textiles, leather tanning, and also used in the industry (Sbertó). Chemical with widespread use in this area (A), lies the importance of the potato crop being an energy-rich and contains important nutrients. It is considered a staple food for the countries of Europe, the Americas and Africa, as the wheat is the staple food of the Eastern Mediterranean to the Asian countries seeking to increase production of potatoes to increase the area under cultivation and increase production together to cover need for population growth and bridging the needs of food. Potatoes contain about the contents of the bread calories (3).

RESULTS AND DISCUSSION

Notes from the table (2) fluctuation of potato crop production during the period of the research that compound annual growth rate for the area was about (0.948%), while production recorded an annual growth rate was (0.612%), while the productivity growth rate was (-1.974%), and the reason for the emergence of negative sign is that the production growth rate is less than the growth rate of the area and this shows that the unit area yield of potato crop did not rise to the level required.

On the other hand, the output has grown at an annual rate of low (0.6%), having grown both in size and productivity growth rates are (0.9, -1.9)%, respectively, which indicates the influence of the production dunam by the largest of the area during the years of research.

Table (2) the size and production and yield of potatoes for the period (2000-2012)

Years	Area / dunums	growth rate	Production / thousand tons	growth rate	yields dunam kg / dunums	growth rate
2000	153828	-	541	-	19655	-
2001	151283	1.654-	620	14.660	19922	1.358
2002	167895	10.980	774	24.706	21937	10.114
2003	161388.5	63.436-	508	34.355-	2767.9	87.382
2004	154439	151.576	629	23.743	21917	691.827
2005	203479	31.753	807	28.292	19094	12.880-
2006	179970	11.553-	794	1.506-	20917	9.547
2007	133148	26.016-	597	24.746-	20162	3.609-
2008	132029	0.840-	348	41.665-	12855	36.241-
2009	78747	40.807-	221	36.628-	12034.1	6.385-
2010	52514	34.080-	203	8.045-	21731	80.578
2011	161759	214.009	557	174.252	14882.5	31.514-
2012	333317	7.516	586	5.142	15168.3	1.92
Rate of Compound growth		0.948		0.612		-1.974

Consumes the individual through global supply system around (33 kg of potatoes per year), whereas the share of the Iraqi individual at the country level of the few crop amounted to approximately (15-18 kg per year), as can be seen from the table (3).

Table (3) production and per capita share of domestic production the potato crop for the period of (2000-2012)

Year	Population/thousand	Production /* thousand tons	** percapitashare of domestic production kg / capita per year
2000	24086	544	22.6
2001	24813	622	25.1
2002	25565	775	25,8
2003	26340	608	23
2004	27139	629	23.2
2005	23963	807	33.7
2006	28810	795	27.6
2007	29682	598	20.1
2008	30680	349	11.4
2009	31200	223	7.2
2010	32481	204	6.3
2011	33330	557	16.7
2012	33000	586	17.8

* USDA / Statistics

** From the work of a researcher based on the Ministry of Agriculture and planning data

Been building a model for the production of potatoes in Iraq, according to a multi-linear regression equation of the factors affecting the potato-producing quantities reflect, as follows

After subjecting the data to Farrar & test Glauber to indicate whether the variables illustrations entering in the construction of the specimen (space, yields dunam rate, production, spatial location (province, time) associated with linearly, has been shown to lack of linear multi-problem and to the fact that inflation Diversity factor values (VIF) for all explanatory variables are less than (10) also shows that the table (4), so will the use of multiple linear regression analysis least-squares across statistical program ready (SPSS) and for the moral and appropriate specimen statement.

Table (4) analysis of variance ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.300E12	4	3.250E11	418.830	.000a
Residual	3.880E10	50	7.759E8		
Total	1.339E12	54			

The table above shows the contrast ANOVA moral specimen thoughtful analysis of the fact that the value of P - value less than 0.05, which calls for the adoption of the specimen in the productivity of agricultural crops, including potatoes analysis.

Note that there are significant parameters of the specimen parameters, namely Regions parameters space and rate yields dunam as she was P - Value values smaller than 0.05.

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + u_i$$

Y_i β_0 : Hard limit :Response variable represents the amount of output for the potato crop

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ Tendency for the growth of the specimen parameters

X_{i1} : Explanatory variable is a valid area for the cultivation of the potato crop Explanatory
 X_{i2} variable yields a dunam rate of the potato crop

X_{i3} : Explanatory variable is the time for the production of potato crop

X_{i4} : Descriptive variable represents a spatial location (conservative) to the potato crop

u_i : Random error

Table (4) showed a statistical analysis that the t-test parameter value (space, yields dunam rate) were morale and by the fact that the value of P - value less than 0.05, while morale did not appear to my teacher (spatial location conservative, and time) to the fact that the value of P - Value greater than 0.05 and reflect the results of the specimen that the increase in one unit in the production of potato crop offset by an increase in the values of (space, yields dunam rate, spatial location (province, time) of (4.287, 17.752, 465.516 0.3774), respectively. we note that space and productivity (yields dun am) are two of only affect a large degree in the specimen, while it was not for the spatial location (conservative) and time clear role in influencing.

We also note that the value was equal to 0.97, a very large value and found that 97% of deviations or variations in potato production are explained by the estimated decline of the specimen studied equation, and approximately (3%), a very small percentage has been unable estimated regression equation interpretation being attributed to factors foreign vague and random chance.

Tab(5) Analysis of variance table

Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	-1.023E6	2295632.204		-.445	.658		
VAR00001	4.287	.118	.980	36.344	.000	.797	1.254
VAR00003	17.752	3.761	.123	4.720	.000	.859	1.164
VAR00006	465.516	1141.491	.010	.408	.685	.875	1.143
VAR00007	3774.131	2997.381	.034	1.259	.214	.785	1.274

After the results of the statistical analysis showed a significant variation in the analysis of the specimen table studied, as well as we have noted significant variables for the two parameters (area and productivity), we have to figure out which of the two variables had a great importance and the degree of impact on the production of potatoes in Iraq. Through Ready program SPSS was partial correlation coefficient is calculated for each variable of variables in terms of the rest of the other variables entering in the construction of the specimen, as the value of the partial correlation coefficient of the variable space in terms of the rest of the other variables (.816), as

the value of the partial correlation coefficient for the variable productivity in terms of the rest of the variables other (0.731), and through these results we note a greater impact on the productivity of the area account (though both are influential) to increase the production of potato crop in Iraq. Analysis indicates that the space above factor has a greater impact of productivity factor and this means that the more space and one unit productivity increased by 82%, while productivity has interpreted 73% of the total of these changes in the output of potatoes

CONCLUSIONS

1. The potato production has suffered from fluctuating during the period of research, which is reflected in the per capita share of the domestic product and make those weak share.
2. The highest area planted crop was in 2005 and amounted to (203 729) acres and the lowest area planted was in 2008 and amounted to (132 034) acres
3. The highest production was in 2005 and amounted to (807 586 tons) and the lowest production was in 2010 and amounted to (204 597 tons).
4. Fluctuating dunam productivity of the crop reaching higher productivity in 2002 was (4609) kg / acre and the least in 2008 and was the (2642) kg / acre.
5. The area of influence greater productivity account (though both are influential) to increase the production of potato crop in Iraq.

COMMENDATIONS

1. Increase the cultivated potato spaces.
2. The introduction of new technologies more broadly to increase production.
3. The introduction of high-yielding varieties to obtain a higher output.
4. input subsidies and encourage domestic product discharge its products.

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