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Mohammed Omar Shareef *
Jadoua Shehab Ahmed

College of Agriculture - Tikrit University, Iraq

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Determinants of increasing the productivity of the wheat crop from the viewpoint of farmers in Salah al-Din Governorate, Iraq, and its relationship with some factors

ABSTRACT

The agricultural economic development and increasing agricultural productivity is one of the priorities for Iraq because of its relationship to food, people's lives and food security. The main basis for agricultural economic development and achieving national food security, the problem of cultivating strategic crops lies in the fact that they suffer from low productivity and fluctuations, and that there are determinants and problems that impede increasing the productivity of strategic grains, especially wheat, , and for these reasons the study aimed to know The nature of agricultural economic development and agricultural productivity and a study of what are the determinants that lead to reduced productivity of wheat as a model for strategic crops. In this study, the determinants that hinder the increase in agricultural productivity of the wheat crop in Salah El-Din Governorate were diagnosed, according to their priorities and their relationship with some variables, and the areas affecting agricultural productivity and the most important paragraphs in these areas were also identified, as well as the identification of the most important problems that hinder the process of increasing productivity. The study came out with a number of important results and a number of recommendations, including finding a partnership with international companies to produce various modern irrigation systems and the production of pesticides in Iraq. And to allocate funds for this fund that are deducted directly from the federal state budget.

INTRODUCTION

Grain crops are of great strategic importance, especially the wheat crop, as the wheat crop is the most strategically and economically important, and it is the first necessary food commodity in most countries of the world, and most countries of the world, including Iraq, seek to achieve self-sufficiency from it.

As for the most important agricultural governorates in Iraq, they are Nineveh, Salah al-Din, Tamim and Erbil in the north, Wasit in the alluvial plain and Anbar in the west (Al-Awadi, 2017, 1). Increasing the productivity of the wheat crop is a major goal for every rational developing economy, so it is necessary to identify the change in productivity. Total factor productivity and what are its sources of growth is the main way to know what the economic sectors are facing in terms of scientific and technical development and progress, and what is the possibility of using and developing positive factors, and getting rid of and avoiding negative factors (Al-Najafi, Al-Nuaimi, 1998.)Accordingly, agricultural productivity has a unique and distinguished position in the lives of nations and their economies, the process of economic development, modernization of agriculture, and renewal of the national economy. This is done through modernizing machinery, raising the levels of workers in material and moral aspects, increasing national income and increasing production while reducing working hours, providing social, educational and health services, and

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* *Corresponding author: E-mail*: mohmeedomear@tu.edu.iq

stabilizing the infrastructure of the community. All of this is linked to increasing productivity and reaching high levels, (Al-Tanobi 1995,: 41) and (Ajmal Hammoud and Al-Fakhouri 200)1. The importance of increasing productivity is as follows:

1-Achieving political stability through the prosperity of the economy and the provision of hard currency

2-Reducing imports of raw materials by optimizing the use of raw materials

3-Raising the standard of living for members of society and increasing their welfare by increasing the level of income. (Hammoud and Fakhoury 2009: 49)

On this basis and its importance to the agricultural and productive wheat crop in Salah al-Din Governorate, being the most cultivated crop, this study was conducted on the determinants of increasing the productivity of the crop from the point of view of the farmers of the crop in the governorate.

Objectives of the study: The study had several objectives, which are:

1-Astudy of the determinants that impede increasing wheat productivity in Salah El-Din Governorate from the perspectives of wheat farmers in the governorate, as follows:

-Determining the impact of the study factors (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, agricultural determinants) that impede increasing the productivity of the wheat crop from the point of view of the crop growers in Salah al-Din Governorate.

A- in general

B-Determining the impact of each field of study (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, and agricultural determinants).

2-Arranging the determinants that affect wheat productivity in Salah al-Din Governorate for each field of study (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, agricultural determinants)

3-Determining the variance from the point of view of wheat farmers in Salah El-Din Governorate by the effect of the studied factors on wheat productivity according to some personal characteristics (age, educational level, cultivated area, type of irrigation, participation in training courses, trend towards using modern agricultural techniques)

4-Identifying the most important problems that wheat growers suffer from in the study area, which lead to a reduction in productivity and arranged in descending order according to the arithmetic average.

Research hypotheses: Statistical hypotheses were developed according to the studied independent factors, as follows:

1.All averages are equal according to the age groups of the farmers.

2.All averages are equal according to the educational level categories of the farmers.

3.All averages are equal according to the categories of the area planted with wheat.

4.All averages are equal according to the categories of irrigation methods used in irrigating the wheat crop.

5.All averages are equal according to the categories of the number of agricultural machines and machines owned by the farmers.

6.All averages are equal according to the categories of the trend towards the use of modern agricultural techniques by farmers.

Alternative Statistical Hypotheses:

1.All averages are not equal according to the age groups of farmers.

2.All averages are not equal according to the educational level categories of farmers.

3.All averages are not equal according to the categories of the area planted with wheat.

4.All averages are not equal according to the categories of irrigation methods used in irrigating the wheat crop.

5.All averages are not equal according to the categories of counting agricultural machines and machines owned by farmers.

6.All averages are unequal according to the categories of the trend towards the use of modern agricultural techniques by farmers.

The importance of the study: The importance of the study stems from the importance of the agricultural sector and agricultural economic development in general, as well as the importance of strategic grain crops, especially wheat, as they are the main part in securing food, achieving food security, and supplementing and increasing the domestic product. There is a change in the structures of the agricultural sector to provide people's livelihood by increasing agricultural productivity rates (yields) and bringing production to self-sufficiency, and in light of this importance, this scientific research was carried out.

Study methodology: To achieve the objectives of the study, the curriculum was adopted, as the descriptive approach gives accurate and real information in the interpretation of social and economic phenomena (Al-Mahmoudi 2019, 46), and the descriptive approach is appropriate for studies aimed at describing phenomena or what is present. Interviews and direct observations, and one of its advantages is that through its monitoring and interpretation of reality, it helps to change the controlling conditions. (Fadel 2010, 103)

The study area: The study area includes what is in the administrative borders of Salah Governorate, according to the agricultural division of Salah Agriculture Directorate and its agricultural people. Wheat is one of the governorates with the highest productivity (yield) per dunum, as the area planted with wheat in the year 2020 is (748189) dunams, while the productivity of the wheat crop in the governorate is (846.2) kg / dunum, and the contribution of the governorate's production of wheat reached 10.1% of the total production in Iraq. (Annual Statistical Group for the year 2020, Ministry of Planning)

The research community and its sample: The research included all wheat growers in Salah El-Din Governorate distributed among the agricultural divisions, which number (20) divisions, administratively affiliated to the Salah El-Din Agriculture Directorate.) Agricultural Division, as the number of wheat farmers covered by the research reached (3744) farmers, a simple random sample of farmers with a number of (30) farmers was taken randomly to conduct the pre-test and they were excluded from the research sample, a random sample of 8% of the total farmers in Each agricultural division, thus the number of farmers covered by the research procedures became (297), as shown in Table (1)

Table (1): Distribution of the research sample by agricultural divisions

#	Agricultural Division	Farmers	Sample
1	Digla	413	33
2	Samarra	525	42
3	Tikrit	895	72
4	Biaji	398	32
5	Al-Mu'tasim	188	15
6	Ishaqi	255	20
7	Tulul Bagh	163	8
8	Alalam	280	22
9	Aldoor	412	33
10	Balaid	193	15
	Total	3714	297

Preparation of the questionnaire: The questionnaire was adopted as a means of collecting data for the study, and in a number of stages, the first stage is to inform the researcher about previous studies and specialized books, while the second stage is to convert the readings into the form of a pre-questionnaire, and then the questionnaire form was divided into three parts: as following:

Part One: This part included the personal characteristics of wheat farmers in Salah al-Din Governorate, which are (age, educational level, cultivated area, type of irrigation, trend attitude of using modern agricultural techniques).

Part Two: It is a measure to identify the determinants of increasing agricultural productivity (yield) for the wheat crop from the point of view of wheat farmers in Salah al-Din Governorate, and this

scale consists of (49) items that have a triple scale (agree, neutral, disagree) and it also consists of (5) fields. As shown in Table (2)

Table (2): fields and preparation of the questionnaire items in their initial form

#	Fields	paragraphs
1	The field of technical limitations	10
2	The field of administrative and organizational determinants	11
3	Natural and Environmental Determinants field	10
4	Irrigation and water determinants field	9
5	The field of determinants of wheat cultivation	11
	Total	49

Part Three: In this part, specialists and experts in the cultivation of wheat in the departments of Salah al-Din Agriculture Directorate, experts in the Al-Nahrain Company for the production of certified seeds, and researchers in the field crops, soil and water departments at the College of Agriculture / Tikrit University, as well as the many wheat growers in the governorate, were consulted. These consultations identified (11) main problems, which face wheat farmers in Salah al-Din Governorate, and were developed in the form of a five-problem scale (very large, large, medium, small, none).

Measurement of the characteristics of the resolution:

1- **Virtual validity**: it has been verified by presenting the questionnaire to a group of specialists in economics, agricultural extension and psychology to verify that the questionnaire is suitable for the objectives for which it was prepared. Regarding the questions and their difficulty for the respondents, some paragraphs have been modified and (3) paragraphs have been deleted by experts, and thus the measurement paragraphs settled with (46).

2- **Content validity**: The validity of the content was verified by presenting the questionnaire to a group of specialists in the fields of field crops, soil and water departments.

3- **Stability**: After completing the questionnaire in its final form, the pre-test was conducted on a survey sample consisting of (30) farmers from outside the sample of the research community in order to ensure a clear questionnaire form for the respondents and to calculate the reliability and validity coefficient, and the meaning of stability is to ensure The questionnaire gives the same results if it is used again (Al-Mahmoudi 2019, 136), the SPSS program was used to calculate the stability, as well as the split-half method for the fields whose number of paragraphs was even and the Facronbach method for the fields whose paragraphs were odd, and to obtain the validity was taken The square root of the stability coefficient for each field and the results were as shown in Table (3)

Table (3): Stability and validity of the research fields

#	Fields	reliability	validity
1	Technical limitation field	0.90	0.82
2	Administrative and organizational determinants field	0.88	0.78
3	Field of Determinants, Natural and Environmental	0.91	0.84
4	Irrigation and water determinants field	0.94	0.89
5	Field of determinants for wheat growers	0.88	0.78

Data collection: The data was collected after completing the questionnaire according to the scientific requirements, as the data were collected from the (297) respondents using the personal interview method in the period (6-12-2021) until the period (3-10-2021).

Measurement of study variables: The measurement process is defined as describing information in a quantitative and descriptive manner, in which we use numbers to express data and information in an accessible manner that can be easily understood and interpreted (Latad et al., 2019: 23).

Measuring independent variables: Age: It was measured by the number of years the age of wheat growers in Salah Governorate when collecting data. Educational level: It was measured with (8)

alternatives (mother, read and write, primary, intermediate, middle school, institute, college, higher certificate, and she was given the numerical values 7,6,5,4,3,2,1, 0) As for the cultivated area, it was measured by the number of dunams planted with wheat, and the type of irrigation was measured by three parameters (sprinkler irrigation, traditional irrigation, rain irrigation) and numerical values were given to it (1,2,3), respectively.

Dependent variable measurement: The dependent variable was measured by (46) items in five domains, and was placed in front of each item of the following four-level scale (large, medium, few, none), and they were given numerical values (1,2,3,4).), and the scores were distributed on the domains as in Table (4).

Table (4): Fields, number of paragraphs, and degree of scale

#	Fields	Scale	Number of Paragraphs
1	Technical limitation field	40-10	10
2	The field of administrative and organizational determinants	36-9	9
3	Field of Determinants, Natural and Environmental	40-10	10
4	Irrigation and water determinants field	28-7	7
5	Field of determinants of wheat cultivation	40-10	10
	Total	184-46	46

- **Measuring the problem**s that wheat growers suffer from that impede increasing productivity: Problems were measured with (11) paragraphs expressing the most important problems and alternatives (very large, large, medium, small, none) were presented with values (5, 4, 3, 2, 1) respectively, and thus the scale is (11- 55).

Statistical Means: After the process of data collection, unloading and tabulation, the statistical analysis process was started using Excel and SPSS, as well as using a number of statistical methods (range, percentages, arithmetic mean, weighted average, and others).

Theoretical framework: The economic and nutritional importance of grain crops is due to many reasons, including that they are of high nutritional value. The nutritional components of grain crops contain high percentages of carbohydrates up to 70%, protein percentages of up to 14%, and a high percentage of oils up to 10%, as well as containing some vitamins and elements. Minerals, and grains have industrial uses such as starch, maltose sugar and alcohol, and grains are used in some countries of the world for the production of biofuels. Also, grain crops provide humans with more than a third of the calories he needs for his activity and growth, as well as providing proteins indirectly through feeding farm animals on them. One of the advantages of grain crops is that they are able to grow and adapt in different environments and climates despite the difference in environmental conditions between the north and south of the earth. Also, grain crops, especially wheat, play strategic roles as they are a source of political pressure between countries. (Al-Baldawi et al., 2014: 22) and productivity is one of the important indicators for agricultural producers and for agricultural economic development. There are several ways to measure productivity and there are several ways to measure it, but the prevailing trend in Productivity measurement is the productivity of a unit area (yield) as a criterion for measurement, and the productivity of agricultural soils is defined as the ability of these soils to produce a quantity of a particular crop in certain conditions such as the date of planting and technological factors in agricultural work (irrigation, plowing, harvesting, etc.), weather conditions and other factors, and all of this indicates However, soil productivity is nothing but the outcome of various factors. (Awwad, 1978: 35) Awareness Agricultural productivity can be defined in general as the effect of using production factors on agricultural output, which is a measure of the production of one unit of the cultivated land area, as it is defined as the ratio of products to The inputs achieved in the agricultural sector, or the amount produced or yielded by one unit of inputs, which are mostly measured in physical units (kg / dunum), and the production is classified It refers to total productivity, Total Factor

Productivity (TFP) and Partial Factor Productivity, and agricultural productivity is the optimal use of the economic resources available in the production process. Productivity can be increased in general through the following factors:

1- An increase in output with less increase in input.

2- A decrease in output with a greater decrease in input.

3- The stability of the outputs with a decrease in the inputs.

4- An increase in the outputs with the stability of the inputs. (Abdul Aziz and Talal, 1986: 211)

RESULTS AND DISCUSSION

1- The first objective: to determine the impact of the studied factors represented in (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, and determinants related to agriculture) on increasing the productivity of the wheat crop from the point of view of the crop growers in Salah al-Din Governorate.

A - **In general**: the results showed that the lowest value of the total determinants that impede increasing productivity from the respondents' point of view is (131) and the highest value is (161), with an average of (149.49), and a standard deviation of (6.296), and the respondents were divided into three categories. And according to the extent, the results were as in Table (5)

Table (5): Distribution of the respondents according to their point of view in determining the effect of the studied factors on increasing the productivity of the wheat crop

Categories	number	percentage	average
137.628 Low (131-141)	39	13.131	137.628
Medium (142-152)	162	54.546	147.709
High (153 - and above)	96	32.323	157.309
Total	297	%100	

Table (5) shows that the highest percentage of respondents is in the medium category (54.546%), with an arithmetic average of (147.709), followed by the high category with a percentage of (32.323%) with an arithmetic average of (157.309), so the majority of respondents are in the medium category, which tends to rise . The reason may be that most of the respondents know the importance and impact of these factors on the productivity of the wheat crop in Salah al-Din Governorate.

B- Determining the impact of each field of study (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, determinants related to farmers) on increasing the productivity of wheat crop from the point of view of wheat crop growers in Salah al-Din Governorate.

First - **The scope of technical determinants**: (10-40) The results showed that the lowest value of the level of effect of technical determinants is (27) and the highest value is (36), with an average of 33.43. The respondents were divided into three categories and according to the extent, as in Table (6).

Table (6): distribution of respondents according to their point of view in determining the effect of technical determinants in increasing the productivity of the wheat crop

Categories	Number	Percentage	Average
Low (27-30)	27	9.090	24.811
Medium (31-34)	120	40.404	32.602
High (-35 and over)	150	50.505	35.525
Total	297	100%	

Table (6) showed that the highest percentage of respondents was in the high category (50.505%) and with an arithmetic average of (35.525), followed by the medium category with a percentage of (40.404%) and an arithmetic average of (32.602), and accordingly the vast majority fall within the high category tend to The reason may be due to the knowledge of the majority of the

respondents about the problems of modern agricultural techniques and they realize its importance in increasing the productivity of the wheat crop in Salah al-Din Governorate.

Second - The scope of administrative and organizational determinants: its value is limited to (9-36) that the lowest value for the level of influence of administrative and organizational determinants is (22) and the highest value is (36) with an average of (34.5), the respondents were divided according to the range into three categories, the results as in the table (7)

Table (7): Distribution of the respondents according to their viewpoint of farmers in determining the impact of administrative and organizational determinants on increasing the productivity of the wheat crop

Categories	Number	Percentage	Average
Low (22-26)	12	4.040	23.25
Intermediate (27-31)	39	13.131	33.86
High (32-36)	246	82.828	35.15
Total	297	100	

Table (7) showed that the highest percentage of respondents was in the high category (82.828%), with an arithmetic average of (35.15), followed by the medium category with a percentage of (13.131%) and an arithmetic average of (33.86), and this shows that the vast majority in the high category tend slightly to the medium Perhaps this is due to the fact that the majority of the respondents are in direct interaction with the official organizations in the study area, as well as their knowledge of the suffering of routine when they are equipped with modern technologies that increase their productivity.

This leads to them abandoning the techniques, all of this has negative effects on the productivity of the wheat crop in Salah al-Din Governorate.

Third - The scope of natural and environmental determinants: (10-40) The results showed that the lowest value for the level of influence of natural and environmental determinants is (17) and the highest value is (31) with an average of 24.81, and the respondents were divided into three categories and according to the extent, and as in the table (8)

Table (8): Distribution of the respondents according to their point of view in determining the impact of natural and environmental determinants on increasing the productivity of the wheat crop

Categories	Number	Percentage	Average
Low (17-21)	27	9.090	19.533
Medium (22-26)	213	71.717	24.597
High (-27 and above)	57	19.191	28.105
Total	297	%100	

Table (8) showed that the highest percentage of the respondents falls within the medium category (71.717%) and with an arithmetic mean of (24.597), followed by the high category with a percentage of (19.090%) and an arithmetic average of (28.105), and this result shows that the vast majority within the medium category tend to high. The reason for this may be that the majority of the respondents know the effect of natural and environmental factors on increasing the agricultural productivity of the wheat crop in Salah al-Din Governorate.

Fourth - Irrigation and Water Determinants Scope: (7-28) The results showed that the lowest numerical value for the level of impact of technical determinants is (19) and the highest value is (27), with an average of 23.29, and the respondents were divided according to the range into three categories as in the table (9)

Table (9): Distribution of the respondents according to their point of view in determining the effect of irrigation and water determinants in increasing the productivity of the wheat crop

Categories	Number	Percentage	Average
Low (19-21)	72	24.422	20.661
Medium (22-24)	135	45.454	23.130
High (25-27)	90	30.303	25.633
Total	297	%100	

Table (9) showed that the highest percentage of respondents falls within the medium category with a percentage of (45.454%) and an arithmetic average of (23.013), followed by the high category with a percentage of (30.303%) and an arithmetic average of (25.633), and this indicates that the result is that the vast majority fall Within the medium category, it tends to be high, and perhaps the reason for this is that the majority of respondents know that irrigation and water are the mainstay of the agricultural production process and that increasing the productivity of the wheat crop in Salah al-Din Governorate is linked to the availability and abundance of irrigation water and the method of irrigation used.

Fifthly - The scope of the determinants associated with the farmers: (10-40) The results showed that the lowest numerical value for the level of influence of the determinants associated with the farmers is (28), and the highest value is (37), with an average of 33.64, and the respondents were divided according to the range into three categories, As in Table No. (10)

Table (10): Distribution of the respondents according to their point of view in determining the impact of determinants related to wheat cultivation on increasing the productivity of the wheat crop

Categories	Number	Percentage	Average
Low (28-31)	51	17.172	30
Intermediate (32-35)	207	69.696	33.816
High (36-and over)	39	13.132	37.465
Total	297	%100	

Table (10) showed that the highest percentage of respondents falls within the medium category (69.696%) and with an arithmetic average of (33.816), followed by the low category with a rate of (17.171%) and an arithmetic mean of (30), and this means that the result is that the vast majority fall within the category The medium and which tend to decline, the reason for this may be that the majority of the respondents need to change in some production methods and that there are modern agricultural methods whose productivity is greater than the traditional methods.

2- **The second objective**: to arrange the determinants affecting wheat productivity in Salah El-Din Governorate:

A- **Arranging each field of study** (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, farmers' related determinants). The fields of study were arranged in descending order and according to the arithmetic mean and the weighted average, and the results were as in Table (11).

Table (11): The areas that affect the increase in wheat productivity in descending order, according to the arithmetic average and the weighted average

#	Felids	Number	Arithmetic average	Weighted average	Rank
1	Administrative and organizational determinants	9	34.5	95.83	1
2	Determinants related to agriculture	10	33.46	83.65	2
3	Technical Specifications	10	33.43	83.5	3
4	Natural and Environmental Determinants	10	24.81	62.02	4
5	Determinants of irrigation and water	7	23.29	25.00	5
	Total	46			

Table (11) shows that the area of administrative and organizational determinants is the first to influence the productivity of the wheat crop in Salah El-Din Governorate from the point of view of wheat growers in the governorate with an average of (34.50)

The reason for this is perhaps because the government routine has a direct impact on the respondents through dealing with government department employees, which negatively affects the wheat growers in the governorate, while the field of irrigation and water determinants was taken in the latter with an arithmetic average of (23.29).The reason for this may be because the water problem is imperceptible in the governorate, as most wheat growers depend on well water, especially those who use sprinklers, which makes farmers not interested in the lack of rain or the lack of water in the rivers that enter the country.

B- Arranging the problems in descending order and according to the arithmetic average facing wheat farmers, which hinder the increase in productivity.The problems faced by wheat farmers that lead to reduced productivity were arranged in descending order from the respondents' point of view and according to the arithmetic mean, and the results are as in Table (12)

Table (12): Order of the problems facing increasing wheat productivity in the research area in descending order and according to the arithmetic mean

#	problem	Medium
1	The state's delay in paying the prices of the processed wheat to the government's pilgrims	5.00
2	Lack of extension activities in the field of crop cultivation	4.71
3	Lack of specialists to maintain sprinkler irrigation systems	4.42
4	Harvesters not available in time	4.28
5	The wheat grower's lack of knowledge of integrated pest control on the crop	4.04
6	Lack of drawers at the right time to plant the crop	3.95
7	Leakage of agricultural expertise in the field of wheat cultivation to work in the government sector	3.66
8	Delayed programs to improve and renew wheat seed strains	3.57
9	Delayed processing of farmers with improved seeds	3.52
10	Lack of effectiveness of chemical pesticides supplied by the state	3.38
11	There is an intermediate corruption link between wheat growers and the state when marketing the crop	1.47

Table No. (12) shows that the paragraph that ranked first is (the state's delay in paying the prices of processed wheat to the government silos) with an arithmetic average of (5.00), and this is the biggest problem for all farmers and leads to the farmers' reluctance to expand the cultivation of the crop. As for the paragraph that ranks last, it is (there is a corruption ring between wheat growers and the state when marketing the crop) with an average of (1.47), and perhaps the reason is that not all farmers encounter corruption rings, all of the above problems are of great importance and

directly affect productivity because they From topic sources, eminent specialists and farmers directly.

The third objective: Determine the variance from the farmers' point of view about the effect of the studied factors on increasing the productivity of one dunum of wheat crop in Salah El-Din Governorate according to some personal characteristics, which are:

1. **Age**: The ages of the respondents were limited to between (22-65) years, they were distributed into three categories to show the determinants that limit the increase in wheat productivity, and it was found that the third category (the elderly) got the highest average among the groups and to test the significance of the differences between the averages of the groups A one-way analysis of variance was used, and the results were as shown in Table (13)

Table (13): shows the results of the analysis of variance by age groups

#	Categories	Number	mean Percentage	Arithmetic	value F	Probability value	Statistical significance
1	Young people (22-34) years	87	29.30	146.53			
2	81 middle-aged (35-46) years	81	27.27	149.54	17.663	0.000	significance
3	The elderly (47- and over)	129	43.43	151.45			
	Total	297	%100				

From Table - 13- it appears that (p.v < 0.05) reached (.0.000), so we reject the statistical hypothesis that states (all averages are equal according to age groups for farmers). Accordingly, this indicates the existence of a statistically significant difference between the averages of the groups. To find out the source of the variance, the LSD test was used, and the results were as shown in Table -14-.

Table (14): source of variation is the difference in the average

Age groups	Probability value	Difference in averages	Statistical significance
Junior: average	0.0010	3.01	Significance
Junior: Senior	0.0000	4.92	Significance
Average: Senior	0.0250	1.91	significance

variation is the difference in the average of the junior and middle-aged category, as well as the difference between the average of the junior category and the elderly category. The reason may be that young people are more willing to apply modern agricultural techniques in order to raise productivity and are able to solve production problems more than Mediterranean and the elderly, which reduces the determinants of increasing productivity facing wheat growers.

2. **Educational level**: The respondents were distributed according to the educational level into seven categories, as it was found that there were no higher degree holders within the research sample, and the highest average of the determinants was in the category (read and write). One-way analysis of variance was used to show the significant differences between the averages of the educational level categories, and the results were as shown in Table -15-

Table (15): Results of the analysis of variance by educational level categories

#	Categories	Number	mean Percentage	Arithmetic	value F	Probability value	Statistical significance
1	Doesn't read and write	33	11.11	149.70			
2	Reads and writes	36	12.12	150.89			
3	Primary	60	20.20	149.90	1.323	0.247	Non significance
4	medium	39	13.13	148.44			
5	prep	42	14.14	147.74			
6	Institute	33	11.11	149.48			
7	College	54	18.19	150.09			
8	Total	297	%100				

From Table - 15- it is clear that (p.v > 0.05) thus we accept the statistical hypothesis which states that (all averages are equal according to the educational level categories of farmers) and there is no statistically significant difference between the averages of the educational level categories of farmers

3. **Area**: The areas planted with wheat were limited to (4-200) dunums, then the farmers were divided according to areas into three categories, and the highest average of the determinants that increased wheat productivity was in the category of small areas. One-way analysis of variance was used to test the significance of the differences between the average groups, and the results were as in Table - 16

Table (16): Results of Variance Analysis by Area Classes

#	Categories	Number	mean Percentage	Arithmetic	value F	Probability value	Statistical significance
1	Small (4 - 25) acres	119	40.07	151.14			
2	Medium (26 - 47) acres	46	15.49	149.20	6.885	0.001	significance
3	Large (48 - or more)	132	44.44	148.10			
		297	%100				

From Table - 45 - it is clear that (p.v < 0.05) reached (0.001), so we reject the statistical hypothesis that states (all averages are equal according to the categories of the area planted with wheat). In this reference to the existence of a statistically significant difference between the averages of the groups, the LSD test was used to find out the source of the variance and the results were as shown in Table -17-.

Table (17): results of the LSD test by categories of the area planted with wheat

Area categories	Probability value	Difference in averages	Statistical significance
Small: Medium	.0860	1.94	Non-significant
Small: Large	.0000	3.04	Significant
Medium: Large	.3260	1.1	Non-significant

Table - 17 - It appeared that the source of variation is the difference in the average category of small areas and the average category of large areas in favor of small areas, and perhaps the reason is that owners of small areas are not able to use machines, machines and other modern technologies in the cultivation of the wheat crop, which makes the determinants of increasing the productivity of the crop great .

4- **Irrigation**: The methods used to irrigate the wheat crop were divided into three categories, and the bleed irrigation category (rain irrigation) obtained the highest average in the determinants. One-way analysis of variance was used to test the significance of the differences between the average groups, and the results were as shown in Table -18-

Table (18): results of the analysis of variance by categories of irrigation

#	Categories	Number	mean Percentage	Arithmetic	value F	Probability value	Statistical significance
1	sprinkler irrigation	163	54.88	147.87			
2	traditional irrigation	94	31.65	150.16	21.901	0.000	significance
3	rain irrigation	40	13.47	154.50			
	Total	297	%100	149.49			

Table - 18 - shows (p.v < 0.05) where it reached (0.000), so we reject the statistical hypothesis that states (all averages are equal according to the categories of irrigation methods used in irrigating the wheat crop). This indicates that there is a statistically significant difference between the averages of the groups. To find out the source of the variance, the LSD test was used, and the results were as shown in Table -19-.

Table (19): LSD test results by irrigation method categories

categories	Probability value	Difference in averages	Statistical significance
sprinkler irrigation	.0030	2.29	significant
traditional irrigation	.0000	4.34	Significant
rain irrigation	.0000	6.63	-significant

From the table it appears - 19 - that the source of the variance is the difference in the average of the sprinkler irrigation category and the average of the tourist irrigation category, as well as the difference in the average of the sprinkler irrigation and demi-irrigation category. In favor of the category of bloody irrigation, the reason may be that farmers who depend on rain for crop irrigation do not have any option to raise crop productivity when rains are interrupted, and this increases the determinants that impede increasing crop productivity.

5. **Ownership**: The farmers' ownership of the machinery and equipment used in the cultivation and service of the wheat crop was divided into three categories, and the few categories got the highest average in the determinants. To test the significance of the differences between the averages of the groups, a one-way analysis of variance was used, and the results are as shown in Table (20)

Table (20): Results of regression analysis by categories of ownership of machinery and Agricultural equipment

#	Categories	Number	mean Percentage	Arithmetic	value F	Probability value	Statistical significance
1	few (0 - 2)	136	45.80	150.35			
2	Medium (3-4)	129	43.43	149.36	5.611	0.004	significance
3	many (5-6)	32	10.77	146.34			
	Total	297	%100	149.49			

From Table - 21 - it appeared that (p.v < 0.05), which amounted to (0.004), therefore we reject the statistical hypothesis which is (all averages are equal according to the categories of the number of machines and agricultural machinery owned by the farmers), and this indicates a statistically significant difference between the averages of For groups, the LSD test was used to find out the source of the variance. As for the results, as in Table - 21 -.

Table (21): LSD test results) by categories of agricultural machinery and equipment

categories	Probability value	Difference in averages	Statistical significance
few: medium	.1860	0.99	Non -significant
Medium: many	.013	3.02	Significant
few: many	.0010	4.01	significant

From Table - 50 - it is clear that the source of variation is the difference in the average of the medium and many category and the average of the few and many category that got the highest average in the determinants of increasing productivity, and the reason may be that farmers who do not own the machines and machines necessary to conduct agricultural operations and serve the crop according to scientific recommendations do not They get it on specific dates, this causes a decrease in productivity, which makes the determinants of the largest process of increasing the productivity of the crop.

CONCLUSIONS

1-It appeared that the surveyed wheat farmers are affected by the studied factors (technical determinants, administrative and organizational determinants, natural and environmental determinants, irrigation and water determinants, determinants related to farmers) in Salah al-Din Governorate and that their level of influence is average tends to rise, we conclude that the respondents realize the importance and impact of determinants On the agricultural productivity of the wheat crop in the province.

2-The study showed that the administrative and organizational determinants are the most influential among the respondents, and that the governmental administrative routine has a direct impact on the farmers.

3-The study showed that the technical determinants are high, tending to the medium, and this is due to the fact that the majority of the respondents know the importance and impact of modern technologies on agricultural productivity.

4-It was found from the study that the natural and environmental determinants are medium and tend to rise, and this is due to the fact that the majority of the respondents know the importance and impact of these determinants on agricultural productivity.

5-The study also showed that the determinants of irrigation and water are medium and tend to rise, and this may be due to the fact that the increase in agricultural productivity of the wheat crop is directly related to the irrigation methods and the quantities of available water.

6-The study showed that there are influential problems facing the increase in wheat productivity in Salah al-Din Governorate, and the most important problem is (the state's delay in paying the prices of processed wheat to government silos), and this is a problem that leads to the reluctance of many farmers from farming.

7-The study showed that there are significant differences:

A-Between the average age groups of farmers, and the source of the discrepancy is the difference in the average of the junior and middle-aged category, as well as the difference between the average of the junior category and the elderly category, and the reason may be that young people are more willing to apply modern agricultural techniques.

B-between the averages of the categories of cultivated areas, and the source of variation is the difference in the average category of small areas and the average category of large areas in favor of small areas, and perhaps the reason for this is that people with small areas do not use modern technologies, which increases the determinants of their productivity.

C-between the averages of the categories of the types of irrigation used, and the source of variation is the difference in the average sprinkler irrigation category and the average tourist irrigation category, as well as the difference in the average sprinkler and bleeder irrigation category. And in favor of the demi-irrigation category, and perhaps the reason for this is the reliance of the users of demi-irrigation on rain, and thus they have more sharp and clear determinants of increasing productivity.

RECOMMENDATIONS

1-The Ministry of Agriculture and its departments should facilitate its administrative procedures by reviewing all administrative and organizational procedures.

2-The agricultural service and extension departments should take into consideration the determinants that lead to the reduction of agricultural productivity.

3-The Ministries of Finance and Trade shall create a special fund to pay the marketing prices of marketed crops, and that its funds shall be deducted directly from the federal state budget.

4-The Ministries of Agriculture, Irrigation and Industry shall manufacture sprinkler irrigation systems in agreement with international companies to reduce the prices of the systems, as well as ration irrigation water.

5-The Ministry of Agriculture should agree with international companies for the manufacture of bush and agricultural pesticides to reduce pesticide prices, to reduce pesticide prices, and to get rid of agricultural pests at a lower cost.

6-Agricultural extension should be activated in Iraq, and agricultural extension programs should be planned and implemented in the field of intensive agriculture, its types and methods, because there must be a change in traditional agricultural patterns.

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محددات زيادة انتاجية محصول القمح من وجهة نظر المزارعين في محافظة صلاح الدين العراق وعلاقته ببعض العوامل

محمد عمر شريف   جدوع شهاب احمد

قسم الاقتصاد الزراعي – كلية الزراعة – جامعة تكريت – تكريت - العراق

الخلاصة

تعتبر التنمية الاقتصادية الزراعية وزيادة الانتاجية الزراعية من أولويات العراق لارتباطها بالغذاء وحياة الناس والأمن الغذائي. الركيزة الأساسية للتنمية الاقتصادية الزراعية وتحقيق الأمن الغذائي الوطني ، تكمن مشكلة زراعة المحاصيل الاستراتيجية في حقيقة أنها تعاني من انخفاض الإنتاجية ، وأن هناك محددات ومشاكل تعيق زيادة إنتاجية الحبوب الاستراتيجية ، وخاصة القمح. ، وضآلة مساهمة القطاع الزراعي في التنمية الاقتصادية وزيادة دخل أفراد المجتمع ، ولهذه الأسباب هدفت الدراسة إلى معرفة طبيعة التنمية الاقتصادية الزراعية والإنتاجية الزراعية ودراسة ما هي المحددات التي تؤدي إلى انخفاضها. وقد اختيرت إنتاجية القمح كنموذج للمحاصيل الاستراتيجية. وتبين أن نتائج الدراسة الوصفية التي تم من خلالها تشخيص المحددات التي تعيق زيادة الإنتاجية الزراعية لمحصول القمح في محافظة صلاح الدين ، حسب أولوياتها وعلاقتها ببعض المتغيرات. وأوصت الدراسة بعدد من الوصايا منها على الدولة. كما أوصت الدراسة وزارة الزراعة بمراجعة إجراءاتها الإدارية والتنظيمية لتسهيل مراجعات المزارعين في أقسامها والعمل على إيجاد شراكة مع الشركات العالمية لإنتاج أنظمة الري الحديثة المختلفة وإنتاج المبيدات في العراق. كما أوصت الدراسة وزارات المالية والتجارة والزراعة بإنشاء صندوق خاص لدفع تكاليف تسويق المحاصيل الإستراتيجية التي يتم تسويقها في نفس العام ، وتخصيص الأموال لهذا الصندوق ، ويتم خصمها مباشرة من ميزانية الدولة الاتحادية.