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Assess The Impact Of Land Reclamation On Increasing Agricultural Productivity

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Absract:*The article analyzes the state of agricultural lands in Uzbekistan and examines the reasons for their decline. It analyzes the issues of targeted and efficient use of irrigated agricultural lands and programs of measures to improve their reclamation, and makes relevant proposals for their more efficient use. It also analyzes the views of experts on the recognition of land use efficiency indicators in relation to key indicators, based on the fact that the same indicators can not be applied to different organizational and legal forms of land management, given the characteristics of specific and relative indicators of land use efficiency. In Namangan region, econometric models of changes in the volume of crop production depending on the reclamation conditions were developed and analyzed. The reclamation condition of the land as an indicator of land use efficiency was studied and conclusions were drawn on the introduction of mineral and organic fertilizers for crops in agricultural organizations.*

Keywords:*agriculture, land, land resources, agricultural lands, irrigated lands, reclamation, irrigation, reclamation of lands, arable land, productivity.*

1. INTRODUCTION

The world's population to reach 9.1 billion by 2050 and 10 billion by the end of the century will require major changes in the agricultural production system for food needs [1]. This, in turn, is an important factor in improving crop yields through improved land reclamation and efficient use of water resources. In addition, it is necessary to develop measures to reduce greenhouse gas emissions and mitigate climate change in order to ensure sustainable agriculture. This is because agricultural products provide import substitution in production as food and agricultural raw materials. The main means of production in agriculture is land, the use of which in crop production and animal husbandry has its own characteristics that are not unique to other industries. Regarding the role of land as a means of production, it is expedient to maintain the quality and environmental safety of land resources in meeting the needs of the population, as well as in the production of agricultural products and the supply of raw materials for industrial production.

Agriculture is the leading sector of the economy in Uzbekistan, employing 3.6 million people (27% of those employed in the economy). The share of the industry is 32% of the country's

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GDP. Land used for agriculture occupies 45% of the country's territory, and about 50% of the population lives in rural areas.

Full and efficient use of agricultural lands of the Republic of Uzbekistan in order to meet the unlimited needs of limited resources, which is one of the issues of the economy, is a very urgent problem. In this regard, special attention should be paid to improving the condition of irrigated and non-irrigated lands and increasing the efficiency of their use in agricultural reform. This task has been and will continue to be one of the most important priorities in agriculture. Because the efficiency of agricultural production, ensuring economic and food security of our country, increasing the material well-being not only of rural workers, but also of the entire population of Uzbekistan are inextricably linked with the fertility of our land, which is our priceless wealth.

The purpose of the study

To study the state of land use in agriculture and identify ways to optimize the efficient use of land. Achieving this goal is possible by solving the following tasks:

- Carrying out reclamation and economic and econometric assessment of agricultural lands in Namangan region;
- Development of proposals and recommendations on the directions of efficient land use, taking into account the condition of the lands of the study area, and identification of key areas.

2. LITERATURE REVIEW

There are a variety of approaches to the classification of land use efficiency indicators in agriculture, and a number of expert scholars have conducted their research on this, including I.A. Artamonova thinks about the plowing of agricultural lands, the relative indicators of the total area of fertilized land, the total area of agricultural lands. In addition, this author proposes to take into account the organizational and legal form of land management [2]. In this regard, in our opinion, the author has taken into account the fact that individual indicators of economic efficiency of land use in the personal subsidiary farms of peasants and citizens can not be used.

"An important condition for the development of agricultural production based on land use is the support of the state, an important element of which is preferential taxation," said O.Ya. Starkova [3].

In the efficient use of land, O.D. According to Ermolaenko, the large area of land and the lack of transport capacity, in turn, necessitate the development of infrastructure, which is impossible without state participation [4]. It is expedient for the state to act as the main reformer in the development of the agricultural economy. This is because the state supports the reclamation of lands and the application of fertilizers, thereby contributing to maintaining the quality of the land.

Yu.D. According to Bakhteev and ZA Kudyusheva, the profitability of agricultural enterprises depends on the productivity of arable land [5].

T.G. Khanbaev and L.S. Daibova noted that "the overall indicator of land use efficiency is the production of comparable products for 100 hectares of agricultural land or arable land and sold at current prices" [6].

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Currently, the N.A. on the topic of rational use of land resources, identification of problems in their implementation, development of guidelines and implementation of measures to improve the economic use of land resources. Frieva conducted scientific research [7].

In the research of Vita Cintina and Vivita Pukitit, land use efficiency is based on agricultural production, and through proper and efficient use of land, it is possible to solve several problems such as food production, welfare and social sustainability [8].

A.L.Zheliaskov and N.S.Denisova conducted research on the optimal volume of agricultural land use, the concept of optimal land use, the rational size of agricultural land and the impact of the organization of the municipality on the optimal use of land [9].

In general, the study conducted economic analysis of factors and developed recommendations and recommendations on the results, but did not talk about land reclamation and their impact on crop types, correlation-regression analysis of changes in efficiency and future prospects. This, in turn, requires more in-depth research and studies in this area.

3. RESEARCH METHODOLOGY

At all times, the methods used in the research process are selected based on the purpose. The article uses a number of methods, including statistical grouping, comparison, economic and modeling (forecasting) methods to search for rational measurements and determine the optimal solution in the new economic and organizational conditions.

4. ANALYSIS AND RESULTS

An important condition for the development of agricultural production based on land use is the support of the state, in our opinion, it is expedient to tax its important element. In determining the efficiency of land use depends primarily on the reclamation status of the land area. In this regard, it is necessary to create a database on the volume of agricultural land in Namangan region and its condition (Table 1).

Table 1 Agricultural land area of Namangan region of the Republic of Uzbekistan and its condition

Indicators		2000	2005	2010	2015	2018	Change in 2018 compared to 2000,%
Total crop area, hectares		278240	278903	282440	282275	283210	101,8
Low, salty	**hectares**	28400	17160	17813	17431	18490	65,1
	(%)	10,2	6,2	6,3	6,2	6,5	3,7
Moderately salted	**hectares**	13060	8850	7190	6522	5508	42,2
	(%)	4,7	3,2	2,5	2,3	1,9	2,8
Strongly salted	**hectares**	1950	1210	970	764	720	36,9
	(%)	0,7	0,4	0,3	0,3	0,3	0,4

According to the table, the area of land allocated for agricultural products in Namangan region in 2000 was 278,240 hectares, and by 2018, due to the development of new lands

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increased by 1.8% to 283,210 hectares. The study took into account 3 reclamation conditions of this land, in which low salinity in 2000 accounted for 10.2% of the total land area, average salinity 4.7% and strongly saline 0.7%, as noted above, 3.7. %; Decreased by 2.8% and 0.4% to 6.5%; Were 1.9% and 0.3%, respectively. Of course, the data from the table show that reclamation measures have been carried out consistently over the years and the results have been positive. In order to determine the status of land use in Namangan region, it is necessary to study the amount of land allocated by type of product (Table 2).

2-жадвал Land area in Namangan region by types of products (hectares)

Indicators	2000	2005	2010	2015	2018	Change in 2018 compared to 2000,%
Total crop area	278240	278903	282440	282275	283210	101,8
Cotton	94300	104600	87908	82644	68867	73,0
Wheat	83557	84502	88825	90000	86896	104,0
Potatoes	4554	3809	6095	7025	5741	126,1
Melons	1242	1150	2029	2256	1703	137,1

According to the data in Table 2, as noted above, the total area of land allocated for the cultivation of agricultural products in Namangan region in 2018 increased by 1.8% compared to the base year, which in turn was 4.0% for wheat; the area under potatoes increased by 26.1% and melons by 37.1% to 86,896 hectares, respectively; 5741 hectares and 1703 hectares. Such a change is primarily due to the acquired land, and secondly, in accordance with the Decree "On the Strategy of further development of the Republic of Uzbekistan" [10] to modernize and accelerate the development of agriculture and reduce food and grain security; planting of potatoes, vegetables, fodder and oilseeds on vacant lands, as well as planting more intensive orchards and vineyards imallashtirish function, consistent with the increase in desirable look.

Table 3 Information on the main types of agricultural products in Namangan region (tons)

Indicators	2000	2005	2010	2015	2018	Changes in 2018 compared to 2000,
Cotton	243521	273318	240485	235126	160710	-82811
Wheat	277919	410819	449165	483496	390579	112660
Potatoes	79913	76801	152790	241131	264341	184428
Melons	22402	25595	48908	70678	76119	53717

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In Table 3, the volume of cotton production from agricultural products in Namangan region in 2000 amounted to 243,521 tons, but by 2018 it decreased to 82,711 tons due to the reduction of low-yielding cotton fields due to the end of the cotton domination to 160,710 tons. The remaining products in 2018 compared to 2000, including wheat increased by 112,660 tons to 390,579 tons, potatoes by 184,428 tons to 264,341 tons, and finally melons by 53,717 tons to 76,119 tons.

It should be noted that the results of this economic and comparative analysis, along with an assessment of the activities carried out over the past period and the current situation, do not allow to make a scientific decision. In this sense, it is expedient to evaluate the relationship between the resulting factors and the selected factors on the basis of econometric models.

In this sense, the study was based on data on the salinity of agricultural lands in the Namangan region of the Republic of Uzbekistan and the impact on the types of products. – Y(Y_C– cotton harvest, Y_B – wheat harvest, Y_k – potato crop and Y_P –the volume of melon crop), improved land area – YAEM, moderately saline land area – O'ShEM and strongly saline land areas – KSHE Econometric analyzes of their effects were performed. of course, the correlation coefficients between these indicators are first checked (Table 1).

Table 1 Correlation coefficients of the relationship of selected factors to the volume of cotton yield

	Y_C	*Yaem*	*O'She*	*KShe*
Y_C	1			
Yaem	0,743375559	1		
O'She	-0,658725293	0,726256957	1	
KShe	-0,749980036	0,640593942	0,70962	1

The table shows that the improved land area for cotton yields (0.74338) is directly related to the densely packed, moderately saline land area.

(-0.65873) and strongly saline land area (-0.74998) were inversely correlated, there was no multicollinearity in the correlation between the factors, and the parameters of the regression equation between the selected factors were determined in the Eviews program. Eviews allows you to test the equation on the basis of criteria simultaneously with the definition of the regression equation (Table 2)

Table 2 Regression equation on the influence of selected factors on cotton yield in Namangan region and its evaluation on the basis of criteria

Dependent Variable: YC				
Method: Least Squares				
Date: 05/02/20 Time: 14:52				
Sample: 2000 2018				
Included observations: 19				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
YAEM	2.666933	0,772228	3,453556	0.0035
O'ShEM	1.7619438	0,885307	1,990207	0.1322

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KSHE	-3.194073	1,512496	-2,11179	0.0500
C	-6665.79	553,4254	-12,0446	0.7398
R-squared	0.584502	Mean dependent var		229120.5
Adjusted R-squared	0.501403	S.D. dependent var		32647.30
S.E. of regression	23052.72	Akaike info criterion		23.11362
Sum squared resid	7.97E+09	Schwarz criterion		23.31245
Log likelihood	-215.5794	Hannan-Quinn criter.		23.14727
F-statistic	7.033764	Durbin-Watson stat		2.068996
Prob(F-statistic)	0.003553			

According to the data in the table, the parameters are important α=0,05 anddf=19 whent_{tab}=2,093 only from the equation of t_{YAEM}parameter is important. To make sure the remaining parameters are important Mean Absolute Percent Error−MAPEand the Tayle inequality coefficient −TICIt is advisable to check on the criteria. The result of this inspection is reflected in Figure 3 below.

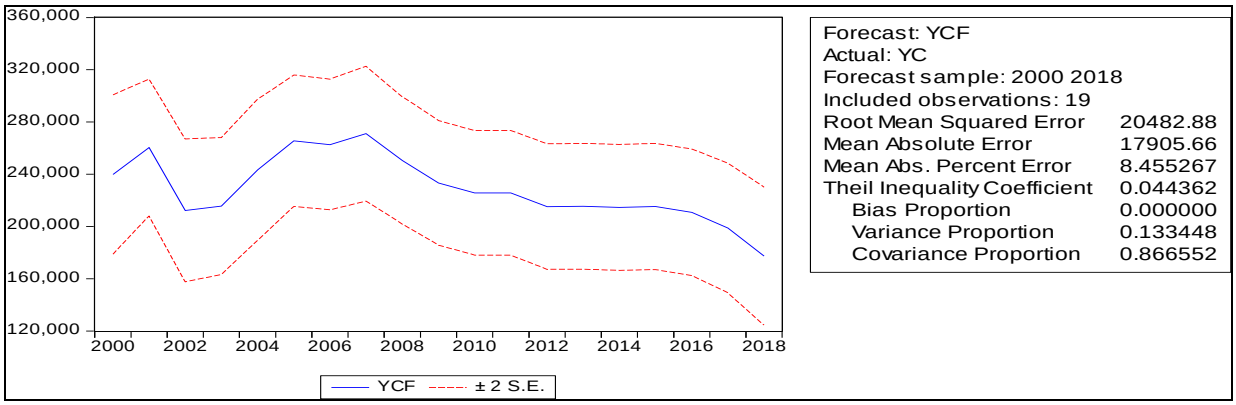

Figure 3. Evaluation of retrospective prognosis features

As a result,MAPE=8,455<10% that the forecast accuracy is high and the Tayle coefficient TIC=0,44≤1it follows that all of the parameters determined are significant, given that they vary in range. Andyα=0,05 when k1=3, k2=15F_{tab}=4,4446equal, which was calculated in turn $F_{account}$=7,0338 The smaller than the Fisher value determines the significance of the equation, and the determined equation is:

Estimation Command:

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LS YC YAEM O'ShEM KSHE C

Estimation Equation:

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YC = C(1)*YAEM + C(2)* O'ShEM + C(3)*KSHE + C(4)

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Substituted Coefficients:

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YC=2.688269102*YAEM+1.75922228769*O'ShEM-3.24322949349*KSHE-6665.8

To summarize the parameters of this defined equation, the following:

YC=2.7*YAEM+1.8*O'ShEM-3.2*KSHE-6665.8 (1)

(1) -regression equation, and as an economic explanation of this equation, it was found that if the area of clean land and the average salinity of land for cotton cultivation were increased by one percent, an additional increase in cotton production by 2.7% and 1.8%, respectively. However, it should also be noted that a one percent increase in the area of strongly saline land would result in an additional 3.2 percent decrease in cotton yields.

Similarly, econometric models of the impact of the Republic of Uzbekistan on the cultivation of other agricultural products in Namangan region depending on the level of land reclamation can be seen in Table 4 below.

Table 4 Models of the impact of land conditions on agricultural production in Namangan region of the Republic of Uzbekistan

	Equation	R^2	Importance o parameters	Significanc e of th equation	Auto-relation
Wheat	Y_B=10.24*YAEM-19.4*O'She+5.8*KSHE-239993.2	0.882639	MAPE=3.011 TIC=0.022	F=37.6	DW=1,87
Potatoes	Y_k=0.045*YAEM+0.001*O'She-2.12*KSHE-34.12	0.829560	MAPE=18,32 TIC=0.091	F=24.336	DW=2.014
Melons	Y_P=43.7*YAEM-9.5*O'She-685.8*KSHE+ 29418.1	0.915134	MAPE=11.8 TIC=0.05	F=53.92	DW=1.898

5. DISCUSSION

The vast majority of agricultural land in the country requires regular land reclamation. In this sense, in order to improve the land use and reclamation of agricultural land, we think it is expedient to do the following:

- land use and protection, regulation of land relations by district (city) khokimiyats, monitoring of the correct placement and actual condition of agricultural crops, organization of rational and efficient use of land;
- Ensuring timely and quality planting, maintenance of agricultural crops, implementation of agro-technical measures, implementation of summer and autumn plowing in a timely manner;
- Development and implementation of a regional program until 2020 to improve the reclamation of irrigated lands in all regions and territories of the Republic of Uzbekistan;
- implementation of measures to further encourage the establishment of specialized irrigation and land reclamation construction and operation organizations, enterprises in the regions;

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introduction of a system of additional benefits for construction organizations, payment of taxes, loans to farms involved in land development, land reclamation;

- Development of a scientifically based scheme of crop rotation in accordance with the natural features of the region, control over its strict observance;
- Strengthening control over land, increasing responsibility for inefficient, illegal, irrational use of land in order to further increase the responsibility of farms and citizens in land use.

This work will not only improve the reclamation of agricultural lands in the country, but also develop the agricultural economy, increase land productivity and crop yields, as well as ensure food security.

6. CONCLUSION/RECOMMENDATIONS

In conclusion, the level of complete and efficient use of land should be analyzed using a specific system of indicators. In recent years, land use efficiency has not been at the level of demand. The reasons are the deterioration of the irrigation and land reclamation of lands, the incomplete introduction of scientifically and practically based crop rotation, the decline in the working condition of irrigation facilities, the lack of incentives for efficient use of land.

In order to increase the level of land use and economic efficiency in the future, it is necessary to ensure the timely and quality implementation of all measures aimed at improving soil fertility and water quality. To do this, it is necessary to develop and implement a regional program until 2020 to improve the reclamation of irrigated lands in all regions and territories of the Republic of Uzbekistan1. It is necessary to ensure that land water monitoring and cadastres are carried out at the level of demand throughout the country.

In our opinion, the generalization of the world experience in stimulating the increase of agricultural land productivity shows that it can be used in Uzbekistan in the following areas:

- Provision of state-guaranteed prices for products produced by farmers who meet certain conditions to encourage the increase of productivity of agricultural lands, in particular, the protection of land and water resources, the implementation of measures to increase land productivity;
- Rendering consulting services to farms on the basis of the development of technologies and recommendations required for specific land plots, providing loans and insurance services to farms on the basis of these technologies and recommendations;
- effective use of rational administrative management and market mechanisms in stimulating the increase of productivity of agricultural lands;
- in the development of long-term programs aimed at increasing the productivity of agricultural land and a specific mechanism for its implementation;
- Strengthening the role of tax and other financial mechanisms in stimulating the increase of productivity of agricultural lands.

The result of the effective implementation of the above measures will be reflected in the sustainable development and increase in the level of profitability of farms using agricultural land, and ultimately in increasing the efficiency of agricultural production.

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