Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.419

Analysis of economic efficiency of the use of irrigated land in agriculture and factors on them

SHOXUJAEVA ZEBO SAFOEVNA[1], MAMANAZAROVA NASIBA JURAEVNA[2]

[1]Associate docent of Karshi Engineering and Economics Institute, candidate of economic sciences, Uzbekistan
[2]Doctoral student (PhD) of the Karshi Engineering Economic Institute
Email ID: shoxujaeva@mail.ru

Abstract: It is known that in recent years the water shortage in agriculture of our country has been growing sharply. Increasing the volume of agricultural production through the efficient and rational use of natural and land and water resources is a topical issue today.

This article analyzes the economic efficiency of the use of irrigated land in the agricultural sector of the Kashkadarya region and the factors affecting it, and also elaborates proposals and recommendations.

Keywords: land and water resources, irrigated agriculture, reservoirs, irrigation and reclamation facilities, groundwater, water-saving technologies, water scarcity, film irrigation, sprinkler irrigation, drip irrigation.

INTRODUCTION

The ongoing economic reforms in our country require the rational and efficient use of natural resources, in particular water and land resources. In the Republic of Uzbekistan, agricultural production is carried out mainly on irrigated lands. The main producer of the crop in the agricultural sector, the largest consumer of water is irrigated agriculture.

About 92% of water resources in the country are used in agriculture. More than 97% of agricultural products are grown on irrigated lands. The main regions of the country are located in the zone of arid climate, and in these areas farming is carried out only through artificial irrigation of crops. Therefore, such lands are the "gold fund" of the Republic. They supply 97% of the gross agricultural output, accounting for about 10% of the total land, or 4.3 million hectares.

In recent years, due to population growth, the area of irrigated land per capita has been declining due to low land development. In addition, it is located in the arid zone of the Republic. Irrigated areas of agricultural production cannot be imagined without water resources. In irrigated agriculture, water is the main means of production like land. The main feature and importance of irrigated agriculture is that it is not influenced by the whims of nature in relation to farming on non-irrigated lands.

Population growth requires relatively efficient and effective use of land and water resources and fixed assets. 12 million hectares of land resources of the country It is suitable for irrigation of about 4.3 million hectares. Hectares of irrigated land; 30.9 mln. Hectares of desert pastures, mountains, sands and other lands. Currently, more than 57% of irrigated land are subject to natural and secondary salinization in the desert and semi-desert zone, and the remaining 43% is composed of high belt soils.

Water scarcity has risen sharply in recent years, especially in recent years. This will lead to a sharp decline in agricultural development. In order to prevent water shortages in the country, additional reservoirs are being built and existing ones are being renovated.

There are interregional reservoirs of national importance and reservoirs of regional significance, which serve agriculture and other sectors of the economy, which include Andijan, Kattakurgan, Tallimarjan, Tuyamoyin, Charvak reservoirs. These reservoirs can store a very large amount of water resources and at the same time serve to supply water to consumers.

MATERIALS AND METHODS

Comparative and comparative analysis, complex assessment methods were used in the study of the problem.

RESULT AND DISCUSSION

Extensive measures are being taken to ensure the sustainable development of all sectors of the agricultural sector and improve the methods of efficient use of water in the southern regions of the country, including the irrigated agricultural region of Kashkadarya region.

In this regard, given the negative consequences of the situation in the lower reaches of the Amudarya over the past 40 years, it is necessary to improve the ecological and reclamation of irrigated lands and improve water management.

The Action Strategy for the further development of the Republic of Uzbekistan for 2017-2021, including ".... further improvement of land reclamation, development of reclamation and irrigation facilities"([1] Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No PF-4947 "On the Action Strategy for further development of the Republic of Uzbekistan") noted. Implementation of this task, including the development of resource-efficient irrigation and water use methods, requires significant research to improve soil fertility.

In determining the efficiency of water use in agriculture, including farms, it is advisable to calculate gross output, net income and net profit in relation to the volume of water actually received by the farm or directed to the irrigated plot, rather than the volume of water from the source in general.

This is because the losses from the source are reduced due to leakage before they reach the farm. In this case, water use efficiency is usually achieved through canal utilization coefficients (Table 1).

Table 1: Systematized scheme of water use coefficients2

Coefficients of water use in kind and value				
1. Efficiency of irrigation system (FIK)	2. Efficiency of irrigation system (FIK)	3. System Water Use Coefficient (KIVS)	*4. Water Supply Level (SRTD)*	*5. Water use coefficient (SFK) for the whole system*
It is the ratio of water flowing to the area (Wnt) to the amount of water received from irrigation sources (Wbr) over a given period (decade, month, growth period).	It is equal to the product of the inter-farm branch (FIKmx) and the inter-farm branch (FIKvx).	The useful water consumption (E * G') of plants in the fields is the ratio of the amount of water obtained from irrigation sources (Wbr).	*It is the ratio of the amount of water actually consumed to the amount of water that should be given according to the norm.*	*It is the ratio of the amount of water reaching the last plot of land to the amount of water obtained from the sources.*
FIK = Wnt / Wbr	FIK = FIKmx × FIKvx	KIVS = E × G'/ Wbr	$СРТД = \frac{ХССМ}{МБСМ} * 100\%$	$СФК = \frac{ЭОУБЕС}{МОС}$ or $СФК = \frac{ЭОУБЕС}{МОС} * 100\%$
Wnt - water flowing into the area, m^3 The amount of water obtained from Wbr-irrigation sources, m^3	FIKmx-inter-farm station, km FIKvx- on-farm outlet, km	Consumption of useful water by e-agricultural crops over a period of time, m^3 / ha G'-irrigated area, ha, Wbr-amount of water taken from irrigation sources, m^3	SRTD - level of water supply, in percent; XSSM - the amount of water actually consumed, m^3; MBSM - the amount of water to be supplied on the basis of the norm, m^3	SFK - water use coefficient; EOUEBS - the amount of water reaching the last plot of land, m^3 The amount of water from MOS sources, m^3

Hence, if the economic efficiency of water use is taken into account by the volume of water reaching the field of water users, the accuracy of water use efficiency indicators will increase, allowing to assess the activities of water consumers.

Many scientists in their scientific work have suggested selling water to users based on market economy relations. They noted that in assessing water, the price of water should be determined on the basis of its operating cost, based on the costs incurred by the state to deliver water to the point of water intake of farms.

This approach also emphasizes that the selling price of water is higher than its cost, and that the difference between the two is the profit of the enterprises of the water management system.

Improving the efficiency of irrigation water use is a task of national importance. The essence of efficient use of water resources is to get the most output per unit of irrigation water at low cost. This is achieved through the implementation of various technology, organizational and economic measures.
The efficiency of water use in irrigated agriculture is characterized by the following indicators:
-Efficiency of irrigation system;
- Water use coefficient in the irrigation system;
-Irrigation water productivity.
The reclamation status of irrigated lands in Kashkadarya region is very variable, and a slight change in any of the natural indicators will change the equality of reclamation indicators, achieved with great effort and resources, very quickly, both in small and large areas. It will take a huge amount of money and, most importantly, time to restore the disturbed reclamation balance.
Brine leaching standards are stratified according to the region's water supply, soil salinity, and mechanical composition. In years with sufficient water supply, saline leaching norms for soils with light mechanical content is 2.0-2.5 per hectare in weakly saline fields; on average - 2.5-4.0 and a capacity of 5.0-6.5 thousand m^3; 4.0-5.0, respectively, in soils of medium mechanical composition; 5.0-6.0 and 6.5-8.0 thousand m^3; in heavy soils 5.0-6.0; 6.0-7.5 and 7.5-9.0 thousand m^3.
In years when water supply is poor, these norms can be reduced from 500 to 2000 m^3. (Table 2).
Scientific research conducted by S. Shahobov shows that the duration of saline washing depends on the degree of salinity and the mechanical composition of the soil.
In the desert conditions of the region, weakly saline soils are washed in February in heavy soils, and in March in soils with light and medium mechanical content.
In moderately saline areas, this event will take place in December and February, respectively. Strongly saline soils are washed mainly in December, only light soils in February.

Table 2: Recommended timing and norms of backup irrigation before saline washing and planting in the desert region (Compiled on the basis of field experiments conducted by S. Shahobov. (1992)), thousand m3 / ha

Mechanical composition of soil	Soil salinity						Backup watering before planting	
	Weak		Average		Strong			
	Terms	Norms	Terms	Norms	Terms	Norms	Terms	norms
When the water supply is 100%								
Light	III	2,0-2,5	II	2,5-4,0	II	5,0-6,5	15. III	1,1
Medium	III	4,0-5,0	II	5,0-6,0	XII	6,5-8,0	10. III	1,2
Heavy	II	5,0-6,0	XII	6,0-7,5	XII	7,5-9,0	5. III	1,3
When the water supply is 75%								
Light	III	1,5-2,0	II	2,0-3,0	II	4,0-5,5	15. III	1,0
Medium	III	3,5-4,0	II	4,0-5,0	XII	5,5-7,0	10. III	1,1
Heavy	II	4,0-5,0	XII	5,0-6,0	XII	6,5-8,0	5. III	1,2

The number of saline washes varies depending on the norms. When the norms are up to 3 thousand m3 per hectare, the salinity of the soil is washed once, in 3-5 thousand 2 and 5 thousand 3 times. In this case, the interval between saline washes should not be less than 6-8 days, and not more.
To ensure quality washing of the brine, water is poured separately on each floor, water from one floor is not transferred to another. In addition, the order of watering the floors will also vary depending on the slope of the land, the depth of the groundwater, the presence of a drainage system, its operation or non-operation.
Typically, under normal conditions, saline washing starts from the floor at the beginning of the field. However, in areas with large slopes or surface runoff, as well as in cases where drainage is not carried out or is not working well, the saline runoff starts at the top of the field, the level of runoff at the bottom rises until it reaches the bottom floor, and the salts are not washed properly. Therefore, in these cases, it is effective to start the saline wash from the floor at the foot of the field.
Once the saline washes are complete, the floors, ditches, and steep ditches obtained in the fields will be leveled as the soil matures. The fields are then flooded en masse in order to reduce the evaporation consumption of the moisture reserves accumulated in the ground and to prevent the associated salts from rising back to the surface.
In recent years, many measures have been taken in the region to maintain the reclamation of irrigated lands and increase crop yields.
The area of mineralization of groundwater up to 1 gram-liter was 18.7% in 2005 and 19.9% by the beginning of 2018. During the same period, the area of groundwater mineralization to 1-3 grams per liter also increased from 21.1% to 25.8 or 4.7%. The area with a level of mineralization of groundwater greater than 3 grams per liter at the beginning of 2015 decreased by 6% to 54.3%.

During these years, the level of mineralization of groundwater increased to 3 grams per liter, and the area above 3 grams per liter decreased. As a result, it was observed that the amount of harmful salts in the upper layers of the soil decreased, and moderate and strongly saline areas became non-saline soils.

The area of average, strongly saline and saline soils decreased from 54.63 and 15.87 thousand hectares to 51.16 and 13.83 thousand hectares, respectively. It can be seen that over the years, the area of lands requiring saline washing, improvement of soil reclamation has decreased from 14.2% to 12.8%. In recent years, the area of moderately and strongly saline, saline soils has decreased significantly due to the correctness of reclamation approaches to saline soils, i.e. washing operations.

Especially in recent years, in Kasbi, Karshi, Kasan, Nishan districts, where the share of production is high, the decline and increase in the level of profitability are examples of this.

Thus, maintaining an acceptable level of groundwater level (around 3 meters), their low salinity (1-2 g / l), mineralization of water used for irrigation (0.8-1.5 g / l), regular Agro-technical and reclamation measures As a result of the improvement, the saline part of the total irrigated area of 517.4 thousand hectares in the region was reduced from 82,220 hectares to 64,990 hectares or 21 percent.

In order to further improve the above-mentioned positive aspects, the Presidential Decree provides for the entrepreneurial use and protection of irrigated lands, first of all, the correct application of agro-ameliorative measures on a scientific basis, maintaining its mineralization within acceptable limits. Repair of drainage networks, coordination of groundwater flow in them, effective use of local and mineral fertilizers.

Only if the land is used properly, its condition will improve and its productivity will increase. This in turn allows for high yields on the farm. Therefore, it is desirable that the attitude to land in every farm should be positive. The analysis of some economic indicators of our region shows the issues of rational use of land, increasing soil fertility, its protection, which is the basis of our well-being.

In the Kashkadarya region, in 1991-2000, the average soil quality score was reduced from 54.5 to 51.0 points. Increased by -10 points. In some other farms that did not meet the above requirements, the quality score of the soil decreased from 58.0 points to 51.0 points. Thus, the analysis of these data shows that some farms in the region have a number of shortcomings in terms of land use and productivity.

Today, the main way to increase land use efficiency is to intensify agriculture. To do this, it is advisable to take the following basic measures:

- ❖ Proper organization of crop rotation in agricultural enterprises;
- ❖ Rational tillage and application of soil erosion control measures;
- ❖ Application of machine systems in the application of mineral fertilizers and tillage;
- ❖ Improvement of land reclamation (complete washing);
- ❖ Cultivation of natural hayfields and pastures;
- ❖ Improvement of land use in agriculture will be achieved through the implementation of organizational, economic measures to increase soil fertility.

When analyzing the indicators of efficient land use, the following specifics should be noted. When land is used for a single purpose, one can only talk about efficiency. However, in the context of the consistent implementation of current economic reforms, the single-purpose use of land is not observed.

In many cases, economic efficiency can be related to social efficiency or vice versa, while recreational, social and economic efficiency can be related to environmental efficiency, i.e., efficiency cannot exist in its purest form. This, in turn, stems from the basic content of the earth in the complex of society and nature.

PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "On the Action Strategy for further development of the Republic of Uzbekistan" for 2017-2021, PF-3932 of October 29, 2007 "On measures to radically improve the system of land reclamation" Decree of the President of the Republic of Uzbekistan dated April 19, 2013 No. PP-1958 "On measures to further improve the reclamation of irrigated lands and rational use of water resources for 2013-2017" Resolution of the Cabinet of Ministers No. 176 "On measures to effectively organize the introduction and financing of drip irrigation and other water-saving irrigation technologies" in order to ensure the implementation of the resolution(Source:www.lex.uz). It was noted that the issue of water and its efficient use is becoming more urgent, the introduction of modern, intensive methods of solving the water problem in our country is a requirement of the times, and large-scale work is being carried out in Kashkadarya region.

Kashkadarya is one of the main producers of grain, cotton and other agricultural products in the country. This can also be seen from the following figures. In 2019, Kashkadarya region took the lead among the regions in the cultivation of grain crops. Its share in the total volume of cereals is 13.4%.

At the same time, the highest share was recorded in Samarkand (9.7%), Fergana (9.4%), Andijan (8.9%) and Surkhandarya (8.8%) regions. The lowest share in the total volume was observed in Navoi region (3.2%) and the Republic of Karakalpakstan (3.8%).

The highest growth rates were recorded in Kashkadarya (120.4%), Surkhandarya (115.9%), Khorezm (112.7%), Jizzakh regions (112.5%) and the Republic of Karakalpakstan (111.4%).

In 2019, 171.5 thousand tons of potatoes, 491.8 thousand tons of vegetables, 163.7 thousand tons of edible melons, 170.8 thousand tons of fruits and berries, 96.6 thousand tons of grapes were grown in the agricultural sector of Kashkadarya region. In addition, more than 964.3 thousand tons of grain crops were produced.
Dehkan (personal assistant) farms remain the main producers of most types of agricultural products, in fact, they produced 84.0% of the total volume of potatoes and 73.4% of vegetables. The bulk of grain crops was produced by farms, which accounted for 85.4% of the total volume of production.
At the same time as increasing the productivity of irrigated lands, expanding arable land, obtaining a rich harvest of cotton, wheat and other crops, to prevent a decline in soil fertility, the development of science-based management and protection solutions is a requirement of the times.
In order to improve the use of land in agriculture of the country, much attention has been paid to such reforms as the lease of land in the sector, the establishment of farms, dehkan farms, family contracts in land use, land use.
Saving water in times of water scarcity requires increasing the efficiency of water use, preventing water from seeping into the ground and being wasted. Due to the imperfection of the existing irrigation methods, the level of water use for irrigation remains low.
Fields are unevenly moistened, irrigation standards are rising, salinization and swamping are taking place (Table 3).

Table 3: Information on the results achieved and key indicators in the water management system of Kashkadarya region(1 Аму-Қашқадарё ИТХБ маълумотлари асосида тузилган.)

Indicators		**unit of measurement**	**2017 yy**	**2018 yy**	**2019 yy**
On water resources	allocated water limit	million.m³	6551,5	4939,0	4587,0
	the amount of water obtained in practice		6898,3	4617,0	5087,2
	percent	%	105,3	93,5	110,9
Cleaning of inter-farm canals	plan	km	168.4	218.3	160.5
	in practice	km	187.7	230.6	165.8
	percent	%	111	106	103
Cleaning of hydraulic structures	plan	thing	374	463	270
	in practice	thing	385	474	275
	percent	%	103	102	102
Repair of hydroposts	plan	thing	268	304	211
	in practice	thing	281	309	218
	percent	%	105	102	103
According to the reclamation program	Allocated funds	million soums	43728.0	52620.3	52744.3
	Disbursed funds	million soums	43980.0	52620.3	55393.3
	Area with improved reclamation condition	hectare	25709	26564	31215
On capital construction	Allocated funds	million soums	27663	43610.5	69900
	Disbursed funds	million soums	27663	45516.1	73249.8
	percent	%	100	104	105

This table shows the indicators of the use of water management systems in agriculture of Kashkadarya region in 2017-2019, which shows that in 2017 and 2019 more water was received than the allocated limit, the plan for cleaning inter-farm canals was exceeded.
Also, cleaning of hydraulic structures, repair of hydro posts in the water management system has been completed. In 2019, 31,215 hectares of degraded lands were improved due to the funds allocated for the implementation of reclamation works under the regional programs of the region.
In recent years, flexible hose irrigation has also been widely used to increase the efficiency of water use in agriculture. In this way, there is no need to take temporary bullet holes in the pile. As a result, on the one hand, if the hectare is complete, on the other hand, a uniform supply of water from all fields is ensured.
With the use of such hoses, labor productivity is reduced by 3-4% compared to irrigated land, and it takes 11.8 working days to irrigate one hectare of land (12.2 working days in the normal way).
According to many years of research, 45-53 kg of fuel per hectare is used when cotton is cultivated 6-7 times during the growing season, while drip irrigation is used 3-4 times between rows and 25-30 kg of fuel is consumed.It can be seen that the drip irrigation method reduces the penetration of tractors into the row spacing of cotton by 2-3 times, saving 35-40% of fuel and lubricants. It also increases the agrophysical properties of the soil.
Typical gray soils are prone to irrigation erosion, and 24-26 tons of soil per hectare is washed away as a result of irrigating cotton fields each year. It was found that this figure can reach 40-45 tons when irrigation is of poor

quality, incorrect and carried out at high water rates. Due to the fact that drip irrigation is carried out without drainage, irrigation erosion is completely eliminated. As a result, soil washing is prevented and productivity is improved. In addition, as a result of irrigation erosion, the washing of humus and nutrients along with the washed soil is eliminated, the mineral fertilizers ensure full plant growth and development of the plant, and an additional 2-3 buds are allowed to grow.

During the growing season, when cotton is irrigated 5-6 times by simple sowing, the average water consumption is 5673 m3 / ha, while in drip irrigation cotton is irrigated 7 times and the seasonal irrigation norm is 3663 m3 / ha. As a result, water savings of 1810 m3 / ha (31.9%) will be achieved.

Table 4: The impact of water-saving technologies on cotton yields

Irrigation method	Yield lik ts / ga	Fuel consumption of lubricants, kg / ha	Water consumption, m3	Cost of 1 ha thousand soums	Income from 1 ha thousand soums	From 1 hectare benefit thousand soums
Furrow irrigation	26	45-53	50000	863,4	1190,8	327,4
Drip irrigation	39,5	25-30	36500	1100	1809,1	-

This means that the effectiveness of drip irrigation is superior to that of conventional irrigation, and in the current period of water scarcity, it is advisable to use this method of irrigation in agriculture of our region. In the studies, the coverage of 1 m3 of irrigation water with a cotton crop averaged 0.44 in the inter-irrigated options compared to the irrigated options from each field; 0.56 and 0.66 quintals, respectively, and the positive values were stated to be obtained from the irrigated variants mulched between the rows with film and straw.

CONCLUSION

In conclusion, in the sustainable development of agriculture

Ensuring the rational and efficient use of land and water resources and environmental protection are the main goals of the priority.

To achieve this goal, the following tasks are identified:

- development and implementation of optimal agricultural and environmental practices (GAEP);
- Development of guidelines for agricultural producers on compliance with the principles of optimal agricultural and environmental practices (GAEP);
- take measures to assist agricultural producers in introducing optimal agricultural and environmental practices (GAEP), as well as optimal production practices (GMP) and other quality standards for agribusiness;
- promoting safe practices for ecology and climate in agriculture.
- Improvement of the mechanism of protection of land use rights in the Land Code of the Republic of Uzbekistan making changes and additions;
- By 2030, a 20 percent reduction in water consumption used to irrigate one hectare of land;
- improving government support mechanisms for local water-saving technology producers and buyers;
- Maintain and increase soil fertility by introducing effective practices for the use of fertilizers based on soil and climatic conditions through the purchase of mobile laboratories for soil analysis;
- Improving the cadastral system of registration of agricultural lands and merging a single information system with the system of accounting of real property rights for land use and accounting of property rights;
- revision of the system of cadastral valuation of agricultural lands;
- improving water resources management system;
- Development of a procedure for reimbursement of water supply costs in agriculture using smart technologies (mini-measuring stations and "smart wand");
- strengthening institutional capacity to ensure biosafety, control the use of natural resources, pesticides and chemicals in agriculture;
- development of the cadastral system of agricultural lands, modernization of the capacity and infrastructure of institutions in the field of land resources management;
- Development and pilot implementation of public-private partnership projects in the field of irrigation in order to increase the efficiency of land and water resources and attract private investment in agriculture.

REFERENCES

1. Resolution of the President of the Republic of Uzbekistan dated March 6, 2020 No PP-4633 "On the widespread introduction of market principles in the cotton industry."
2. Decree of the President of the Republic of Uzbekistan No. PF-4947 "On the Action Strategy for the further development of the Republic of Uzbekistan". 07.02.2017

3. Z.S.Shoxujaeva, A.B.Kurbonov. Sustainable Development Of The Agrarian Sector Depends On The Efficient Use Of Water Resources. International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8 Issue-6, August 2019.
4. Шохужаева З. С. ПУТИ УСТОЙЧИВОГО УПРАВЛЕНИЯ ВОДНЫМИ РЕСУРСАМИ БАССЕЙНА РЕКИ КАШКАДАРЬЯ. – 2016.
5. Шохужаева Зебо Сафоевна. Зарубежный опыт в сельском хозяйстве по использованию водных ресурсов // Economics. 2020. №1 (44). URL: https://cyberleninka.ru/article/n/zarubezhnyy-opyt-v-selskom-hozyaystve-po-ispolzovaniyu-vodnyh-resursov (дата обращения: 03.03.2021).
6. Kurbonov, A. B., and Z. S. Shoxo'jaeva. "Sustainable development of the agrarian sector depends on the efficient use of water resources." *International Journal of Engineering and Advanced Technology* 8.6 (2019):
7. Шохўжаева З.С., Маманазарова Н. Ўзбекистон қишлоқ хўжалигида сув ресурсларидан фойдаланиш борасидаги хорижий тажрибаларнинг аҳамиятли жиҳатлари // Инновацион технологиялар . 2020. №3 (39). URL: https://cyberleninka.ru/article/n/zbekiston-ishlo-h-zhaligida-suv-resurslaridan-foydalanish-borasidagi-horizhiy-tazhribalarning-a-amiyatli-zhi-atlari
8. Shoxo'jayeva Z. S., Norqobilov M. PROBLEMS OF RATIONAL USE OF WATER RESOURCES IN AGRICULTURE OF THE REPUBLIC OF UZBEKISTAN //НАУКА И ТЕХНИКА. МИРОВЫЕ ИССЛЕДОВАНИЯ. – 2020. – С. 25-28. обращения: 03.03.2021).
9. Efficiency Of Formation And Use Of Water Resources In Irrigated Agriculture Of The Republic Of Uzbekistan. ZS Shoxujaeva, MN Utkirovna - The American Journal of Interdisciplinary Innovations …, 2020
10. Шохўжаева З. С., Маманазарова Н. Ж. ЭФФЕКТИВНОСТЬ ИННОВАЦИОННЫХ ПРОЦЕССОВ В СЕЛЬСКОХОЗЯЙСТВЕННОМ РАЗВИТИИ //МИНТАҚА ИҚТИСОДИЁТИНИ ИНВЕСТИЦИЯЛАШНИНГ МОЛИЯВИЙ-ҲУҚУҚИЙ ВА ИННОВАЦИОН ЖИҲАТЛАРИ. – 2020. – С. 329-333.
11. Shoxo'jayeva Z. S. PROBLEMS AND SOLUTIONS IN THE WATER SECTOR OF THE REGION //НАУКА И ТЕХНИКА. МИРОВЫЕ ИССЛЕДОВАНИЯ. – 2020. – С. 21-24.
12. Шохўжаева З. С., Акбарова Ш. Я. ЭФФЕКТИВНОСТЬ ИНВЕСТИЦИЙ В ЭКОНОМИКУ КАШКАДАРИНСКОЙ ОБЛАСТИ //МИНТАҚА ИҚТИСОДИЁТИНИ ИНВЕСТИЦИЯЛАШНИНГ МОЛИЯВИЙ-ҲУҚУҚИЙ ВА ИННОВАЦИОН ЖИҲАТЛАРИ. – 2020. – С. 203-208.
13. Шохўжаева, З. С. "ҚАШҚАДАРЁ ВИЛОЯТИДА СУВ РЕСУРСЛАРИДАН САМАРАЛИ ФОЙДАЛАНИШНИНГ ДОЛЗАРБ МАСАЛАЛАРИ." *Irrigatsiya va Melioratsiya* 3 (2018): 82-88.
14. Analyzed on the basis of data from the Ministry of Water Resources of the Republic of Uzbekistan.
15. Analyzed on the basis of data from the Department of Agriculture of Kashkadarya region
16. Source: www.lex.uz.
17. Amu-Kashkadarya was formed on the basis of ITXB data
18. Z.S.Shoxujaeva. Economic efficiency of water resources use in the agricultural sector. Monograph. T .: "Economy and Finance" Publishing House, 2012. 135 pages.