

**MELIORATIVE STATUS OF IRRIGATED SOILS AND WAYS TO INCREASE PRODUCTIVITY*****Tulkin Tilakovich Rajabov****Associate Professor of the Department of "Technology of Cultivation and Processing of Agricultural Products" of Karshi State Technical University  
Allaerova Umida Akramkulovna**Student of Karshi State Technical University QXT-427-22-group*

**Аннотация:**Қарши дашти шароитида энг долзарб муаммолардан бири тупрок мелиорациясини яхшилаш, иккиламчи шўрланишни олдини олиш, шўрланишга қарши курашиш, тупрокнинг балл бонитетини яхшилаш, экологик ҳолатини талаб даражасида сақлаш.

**Калит сўзлар:** суғориш, сингиш, тупрок, унумдорлик, туз, дехкончилик, агротехник, шўрланиш, сув, сизоб, гектар, минераллаш.

**Аннотация:**В условиях Каршинской степи один из основных проблем является улучшить мелиоративное состояние почв, предотвратить вторичное засоление почв, принимать меры борьбы против засоление, улучшить бонитета почв и охрана естественное экологического состояния природы.

**Ключевые слова:** орошение, поглощение, почва, плодородие, соль, земледелие, агротехника, засоление, вода, просачивание, гектары, минерализация.

**Annotation:**One of the most urgent problems in the conditions of the resistance is the improvement of soil reclamation, prevention of secondary salinization, combating salinization, improvement of soil fertility, and maintaining the ecological state of the demand.

**Key words:** irrigation, absorption, soil, fertility, salt, farming, agrotechnics, salinity, water, seepage, hectares, mineralization.

Assessment of the melioration status of irrigated soils in the Karshi steppe conditions, the formation of undesirable secondary salinization processes during their use, and the composition and characteristics of measures necessary to eliminate these factors depend on the analysis of natural factors. Disruption of agrotechnical processes Irrigation has a significant impact on soil properties, as it increases soil moisture and brings dissolved salts into the water. Irrigation water penetrates the soil, changing the water regime, and secondary salinization occurs due to improper use of irrigation water.

One of the most important tasks facing agricultural workers is to improve soil condition, prevent secondary salinization, combat salinization, maintain soil fertility, its economic efficiency, ecological condition at the required level, and organize natural protection.

More than 45 percent of the 515.08 thousand hectares of irrigated agricultural land are saline to varying degrees, which indicates a 4 percent decrease in saline areas compared to 2012. In recent years, great attention has been paid to improving the reclamation condition of irrigated

agricultural lands in the region. In 2012, 66 hectares, in 2014 - 71 hectares, in 2014 - 71 hectares, in 2014 - 160 hectares, in 2014 - 140 hectares. As of 2018, it has covered 1020 hectares. In 2012, 194.05 thousand hectares, in 2014 - 222.37 thousand hectares, in 2016 - 203.98 thousand hectares, in 2018 - 203.13 thousand hectares organized. In 2012, the area of 3-5 meters above sea level was 320.92 thousand hectares, in 2014 - 292.24 thousand hectares, in 2016 - 309.95 thousand hectares. The indicator covers an area of 280.79 thousand hectares, and it is known that the water level in this valley ranges from 62.23 percent to 54.52 percent.

In the analysis of mineral water levels in groundwater, the area of mineral water levels per 1 liter of water was 102.51 hectares in 2012, 102.62 hectares in 2014, 102.62 hectares in 2016, 98.8 hectares in 2016. In 2018, the area was 100.85 hectares, which is 1.62 times more than in 2012.

During this period, the area with groundwater mineralization of 1-3 grams per liter also decreased from 134.32 thousand hectares to 121.16 thousand hectares, or from 26.05% to 23.52%, or 2.53%. The area with a groundwater mineralization level of more than 3.0 grams per liter was 278.83 hectares at the beginning of 2012, while by the end of 2018 this figure had increased to 293.07 hectares or from 54.07 percent to 56.90 percent, that is, by 2.93 percent over this period.

Table 1  
Changes in groundwater levels

Sizob waters surface. m	2012		2014		2016		2018	
	a thousand to	%	a thousand to	%	a thousand to	%	a thousand to	%
<1	0,03	0,01	0,03	0,01	0,11	0,02	0,09	0,02
1-1,5	0,66	0,14	0,71	0,14	1,40	0,27	1,02	0,20
1,5-2,0	8,50	1,69	7,76	1,51	10,64	2,06	9,92	1,92
2,0-3,0	185,55	35,98	214,61	41,64	193,34	37,52	223,26	43,34
3,0-5,0	204,14	39,59	185,58	36,01	192,10	37,27	164,60	31,96
>5	116,78	22,64	106,66	20,70	117,85	22,86	116,19	22,56
Total	515,66	100	515,35	100	515,44	100	515,08	100

Over the years, a decrease in the amount of salts in the area with a groundwater mineralization level of up to 3 grams per liter has been observed, while an increase in the area with a groundwater mineralization level of more than 3 grams per liter has been observed.

As a result, it was observed that the amount of harmful salts in the upper layers of the soil decreased, moderately and strongly saline areas became weakly saline, and weakly saline areas became non-saline (Table 2).

Table 2  
Changes in the area of saline aquifers with varying degrees of salinity

Salts micdori, g	2012		2014		2016		2018	
	a thousand	%	a thousand	%	a thousand	%	a thousand	%

	to		to		to		to	
<1 г	102,51	19,88	96,78	18,78	96,78	18,78	100,85	19,58
1-3 г	134,32	26,05	120,47	23,37	120,47	23,37	121,16	23,52
>3 г	278,83	54,07	298,19	57,85	298,19	57,85	293,07	56,90
Total	515,66	100	515,44	100	515,44	100	515,08	100

It was found that the area of non-saline soils in the irrigated areas of the region is increasing, while the area of weak, medium, strong and saline soils is decreasing from year to year. Non-saline soils increased from 272.87 thousand hectares in 2012 to 280.33 in 2018 (Table 3).

The area of land with medium, strong and very strong (saline) soils decreased proportionally from 47.86; 12.84 thousand hectares in 2012 to 39.85; 10.23 thousand hectares in 2018. It is seen that during these years the area of land requiring salt leaching and improvement of soil melioration (strong saline and saline) decreased from 12.84 thousand hectares to 10.23 thousand hectares or 20.33 percent.

In recent years, due to improved land reclamation, proper salt leaching, and irrigation, the area of weakly, moderately, and strongly saline and brackish lands has significantly decreased, leading to an increase in non-saline areas.

One of the main factors is the increased performance and efficiency of inter-district, inter-farm and closed-bed collector-drainage networks in the irrigated farming areas of Kashkadarya region. The total length of collector-drainage networks was 14,466.81 kilometers in 2012, and by January 1, 2017, this figure was equal to 15,213.33 kilometers. According to the above, it was found that the per hectare of irrigated area increased from 28.045 pagonometers to 29.56 pagonometers.

It is worth noting that in recent years, the decrease in the cost of production and the increase in the level of profitability in districts such as Kasbi, Karshi, Koson, and Nishan, which have a high production volume, are an example of this.

Thus, as a result of maintaining an acceptable level of syzyb waters (around 3 meters), their low salinity (1-3 g/l), mineralization of irrigation water (0.7-1.8 g/l), agrotechnical and land reclamation activities the total saline area of the 515.08 thousand hectares of total irrigated area in the region decreased from 242.9 thousand hectares to 230.5 thousand hectares, or 12,400 hectares.

The total amount of irrigation water received for irrigation in the region was 4434.32 million cubic meters, and its dry residue per liter was 1.0475 grams. At the same time, the total amount of salt introduced with irrigation water amounted to 5221.73 thousand tons in dry residue.

During the year, the amount of groundwater discharged through the collector-drainage networks amounted to 1434.19 cubic meters. The mineralization level of the collector-drainage waters was 3.9588 per liter of groundwater in terms of dry residue. 7055.82 thousand tons of salt were discharged from the collector-drainage networks and irrigation waters and soil layers. When comparing the amount of salt entering through irrigation water with the amount of salt removed through collector-drainage networks, it was found that 1,626.76 thousand tons of excess salt was removed from the soil layers. This is the case in the Nishan, Mubarak, Karshi, and Mirishkor districts of the region. On the contrary, in districts such as Koson, Kamashi, and

Kasbi, the difference between the amount of salt entering with irrigation water and the amount of salt leaving through collector-drainage networks changed negatively, or in the above-mentioned districts, 169.98; 90.57 and 103.67 tons of harmful salts remained in the soil layers, respectively (Table 4).

Table 4

Water-salt balance in the irrigated areas of the region in 2016

№ №	Districts	Introduction		flowed salts (tons) solid residue	Output part		Salts released (tons)	Changes in the amount of salts (ton +-) solid residue. +-
		the amount of water taken from the district border (mln. m3)	salt content of irrigation water, gr/l solid residue		stay tight	salinity of raw water (gr/l)		
1	Guzor	247,30	1,46	361,06	98,03	6,37	624,26	-263,19
2	Karshi	421,022	1,66	698,90	146,64	5,05	739,80	-40,90
3	Koson	656,32	1,54	1010,73	183,57	4,58	840,75	169,98
4	Kitob	105,66	0,29	30,64	3,80	0,566	2,15	28,49
5	Kamashi	290,23	1,17	339,57	42,38	5,88	249,00	90,57
6	Mirishkor	683,27	1,28	874,59	240,64	4,97	1195,68	-321,09
7	Muborak	279,75	1,25	349,69	195,49	5,56	1086,92	-737,24
8	Nishon	569,45	0,96	546,67	271,09	5,22	1415,09	-868,42
9	Kasbi	507,25	1,19	603,63	159,66	4,43	707,29	103,67
10	Chirokchi	259,74	0,58	150,65	36,59	1,69	61,84	88,81
11	Shaxrisabz	181,2	0,42	76,10	4,26	0,69	2,94	73,16
12	Yakkabog	233,12	0,77	179,50	52,04	2,5	130,10	49,40
<b>By region</b>		<b>4434,32</b>	<b>1,0475</b>	<b>5221,73</b>	<b>1434,19</b>	<b>3,9588</b>	<b>7055,82</b>	<b>2004,08</b>

By correctly organizing the water-salt balance of the irrigated areas, it is necessary to achieve a positive change in the water-salt balance, that is, the amount of salts in the incoming water and soil should be less than the amount of salt leaving through the collector-drainage networks. It is desirable that the balance of water-salt exchange from irrigated areas is at least equal.

To date, 279.56 thousand hectares of the total irrigated area are considered good, and 219.95 thousand hectares are considered satisfactory, or 97.06 percent.

It should be noted that it is desirable to organize the water-salt balance of the irrigated lands correctly, to achieve that the amount of salts in the water and soil entering through the irrigation water does not exceed the amount of salt leaving it.

Based on the presidential decrees, the entrepreneurial use and protection of irrigated lands primarily involves the correct application of agro-ameliorative measures, maintaining the level of its mineralization within acceptable limits, and the use of existing mains, it is recommended to repair inter-district and internal household collector-drainage networks, coordinate the flow

of stormwater in them, and use local and mineral fertilizers in accordance with scientifically developed recommendations.

## REFERENCES:

1. Isaev, S., Rajabov, T., Goziev, G., & Khojasov, A. (2021). Effect of fertilizer application on the 'Bukhara-102' variety of cotton yield in salt-affected cotton fields of Uzbekistan. In E3S Web of Conferences (Vol. 258, p. 03015). EDP Sciences.
2. Isaev, S., Rajabov, T., & Dolidudko, A. (2018). Influence of inorganic fertilizers on cotton crop yield in saline soils. Bulletin of Science and Practice.
3. Исаев, С., & Ражабов, Т. (2008). Тақирсимон тупроклар шароитида субирригация усулида суғрилганда ғўза ҳосилдорлигига таъсири. О'zbekiston qishloq xo'jaligi, (3), 11-12.
4. Ражабов, Т. Я., Ражабов, Т. Т., & Ходиева, С. А. (2022). ҒЎЗАНИНГ ЮҚОРИ ҲОСИЛДОРЛИГИГА СУҒОРИШ ВА ЎҒИТЛАШ МЕЪЁРЛАРИНИНГ БОҒЛИҚЛИГИ. Инновацион технологиялар, 1(1 (45)), 84-87.
5. Ражабов, Т. (2023). ҒЎЗАДАН ЮҚОРИ ҲОСИЛ ОЛИШДА ТАЪСИР ЭТУВЧИ ОМИЛЛАР. Евразийский журнал медицинских и естественных наук, 3(10), 99-102.
6. Abdivokhidovich, I. Z., Tilakovich, R. T., & Pirmat, N. (2022). EFFECTIVE STANDARDS AND TERMS OF APPLICATION OF ATLANTIS HERBICIDE IN GRAIN PRODUCTION IN THE SOUTH OF UZBEKISTAN.
7. Abdivohidovich IZ, Tilakovich RT O'zbekiston sharoitida gerbitsid Atlantis 3,6% va o'g'itlardan foydalanishning kuzgi bug'doy hosiliga ta'siri //Miasto Przyszłości. – 2024. – Т. 55. – S. 142-144.
8. Abdivohidovich IZ, Tilakovich RT, Pirmat N. Atlantis gerbitsidini O'zbekiston janubida don etishtirishda qo'llashning samarali standartlari va shartlari //Yevropa qishloq xo'jaligi va qishloq ta'limi jurnali. – Т. 3. – №. 4. – S. 15-17.
9. Chorshanbiyev N., Musayev M., Qo'ziboyev A. INGICHKA TOLALI G'O'ZA NAVLARINING TARQALISHI VA OZIGA XOSLIGI //Академические исследования в современной науке. – 2022. – Т. 1. – №. 14. – С. 109-111.
10. Abdivokhidovich I. Z., Samandarovich M. M. Effect of the Use of Herbicide and Fertilizer on Economic Efficiency in the Growth of Winter Wheat //European Scholar Journal. – 2021. – Т. 2. – №. 7. – С. 8-9.
11. Rajabov T. T., Qarshiyev A. E., Xojamurotov A. S. IRRIGATSIYA EROZIYASIGA CHALINGAN YERLARDA TUPROQNING HAJM MASSASINI O 'ZGARISHI VA KO 'CHAT QALINLIGI //American Journal of multifunctional publishing. – 2024. – Т. 1. – №. 2. – С. 11-15.