In Uzbekistan, saline lands account for 50.7 % (2170.7 thousand hectares) of irrigation area, slightly saline - 31.4 %, medium saline -15.5 %, strongly saline - 3.8 %. The area of pastures is 20.8 million hectares, of which 18.7 million hectares are flooded, 1.6 million hectares are subject to degression, more than 15.1 million hectares of land are not used in farms (slopes, talus, landfills, Sands, landfills, etc.). From 20 to 40 % of irrigated land is subject to deflation, 2.8 million hectares of pastures need watering, more than 160 thousand hectares are subject to man-made impact. Of the total number of mudflows occurring in Central Asia, 75 % is accounted for by Uzbekistan

Salinization is a serious problem in Uzbekistan's agriculture. The latter occurs due to the evaporation of groundwater containing salt, which due to the capillary effect come to the earth's surface. The output of groundwater occurs as a result of excessive irrigation, insufficient alignment of fields, reducing the efficiency of the drainage system.

From crops these properties are alfalfa, barley, millet, sorghum, Guinea corn, millet, Sudan grass, sunflowers, wheat, beets, licorice, sweet sorghum, maize varieties with a strong root system and tall aerial parts. And if in the first joint sowing the share of alfalfa should not exceed 30 %, then in each next crop rotation it will gradually increase by 20 % until it reaches 100 %. Thus it will be possible to obtain areas fully occupied by forage crops. Taking into account the reclamation properties of these plants, it will be possible to achieve complete soil desalination within 4 – 5 years (with average salinity areas) or 6 – 7 years (with a strong degree of salinity) [1].

Conclusion

Thus, the restoration of fertility of saline areas with the help of biomeliorants is a very effective and promising way to remove easily soluble mineral salts from the soil, unfavorable for cultivated plants. This technology makes it possible to increase the productivity of agricultural land through the use of new territories and to obtain higher yields when growing products on recultivated lands.

At the same time, it is necessary to analyze the impact of complex melioration on improving the fertility of secondary saline lands of arid territories, the role of phytomeliorants in improving the agrochemical and agrophysical properties of soils; selection of crops-saline irrigated lands; study the impact of salinization on yield and studied the water consumption of plants - biomeliorants in the phases of development with and without feeding groundwater.

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GEOINFORMATION TECHNOLOGIES FOR HYDROMODULAR ZONING OF IRRIGATED LANDS OF THE KHOREZM REGION AND REGIMES OF COTTON IRRIGATION.

Annotation: Changes in the hydromodul zoning of the irrigated lands of the Khorezm oasis in the case of water shortages, the distribution of irrigated lands by the hydromodul regions, and the determination of scientifically justified irrigation practices for the major hydromodul regions in the Khorezm region.

Keywords. Hydromodul zoning, scientifically justified irrigation systems of cotton, irrigated land; irrigation period of cotton; agricultural engineering; water shortages; water-saving technologies; irrigation standards; seasonal irrigation rates; limited field moisture capacity, water and soil mineralization; irrigation equipment; mineral fertilizers; vegetation periods.

The issue of global warming becomes a subject not only due to the increase in the average annual temperature of the earth, but also due to changes in the whole global technological system, the rise of the oceans of the earth, the melting of ice and permanent glaciers, the increase in rainfall, the congestion of river flows and climate instabilityand other changes.

Due to global warming, melting glaciers in mountainous regions, the decline will cause a 25-30% decrease in the flow of rivers, especially a part of

Amudarya, Syrdarya and Zarafshan rivers, over the next 20 years, which will cause serious problems in the region and reduce the mineralization of annual water in the lower Amudarya can increase by 1.5 times.

Observing the regime of temperature dynamics in Uzbekistan over the past 50 years, the maximum growth rate of temperature is 0.22 degrees celsius, the minimum is 0.36 degree celsius. Therefore, in 20 years, the average annual temperature in the north of the Republic increases by 2-3 degrees, in the south by 1 degree.

Climate change is caused by 10-15% more water and 10-20% more water consumption at the surface due to the increased rate of transpiration and irrigation of plants. The result is an average 18% increase in non-renewable water consumption. Of course, this will further complicate the growth of agricultural production.

Over the years of independence, our water system has changed dramatically. In early September, the Khorezm oasis stopped the water supply in the rivers, checked and repaired the canal and drainage networks before the flooding began. At present, the irrigation network works without interruption throughout the year with the use of a cotton-winter mill rotating system. The load on the collector-drain network is overloaded. This also affects the process of soil formation in the Khorezm oasis, which increases the area of aqueous soil. Therefore, the scientific research of the 1980s aims at the determination of the hydrological zoning of the irrigation area of the Khorezm Oasis, the distribution of irrigation land by the hydraulic module area, and the scientifically justified irrigation method for the cotton in each hydroelectric module area. This is associated with an increase in water shortages.

Guido all zoning of irrigated land is the division of territory into classification units, which is the purpose of rational use of land and water resources, the application of science-based irrigation procedures, and crop yields.

Basic principles of hydromodule zoning: Central Asia was developed by Legostaev V.M., Konkov B.S. and Gelzer G.P. in 1932-1951 and is based on the mechanical composition of the soil and the location of groundwater.{3}

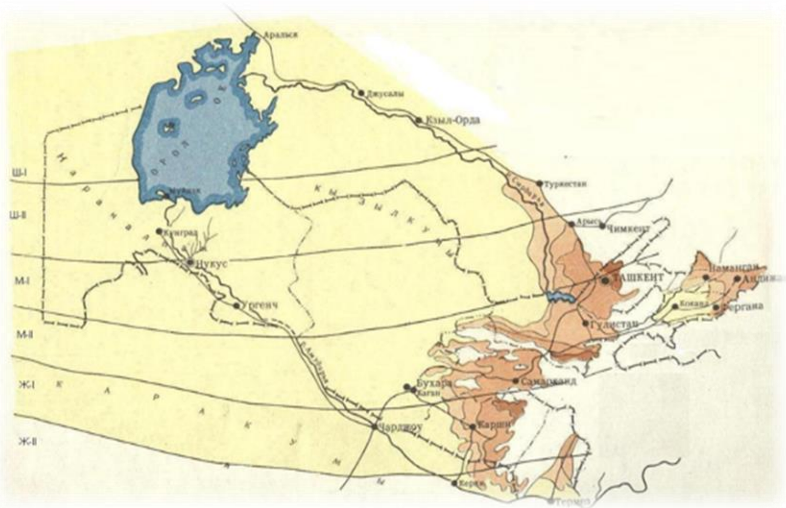
In 1948-1957, Ryzhov S.N., Fedorov B.V. and Yermenko V.E. improved the basic principles of zoning and divided Central Asian land into 10 hydroelectric zones.

Table 1

Number of hydromudul area	Mechanical composition of the soil	Groundwater level, м
1	Lightweight	Deeper from 3-4
2	middle	-»-
3	Heavyweight	-»-
4	Lightweight	From 2 to 3
5	middle	-»-
6	Heavyweight	-»-
7	Lightweight	From 1 to 2
8	middle	-»-
9	Heavyweight	-»-
10	Other	From 0 to 1

Hydro module zoning. Latitude area

In 1968 further improvements were made by the former "Sredazgiprovodkhlopok" (UzGIP MCHJ) institute (Shreder and oth.). Apart from the above, hydrologic geology and land clearing areas have been identified.



These are:

-Deep groundwater has a good flow rate and does not participate in soil formation (groundwater penetration area).

-Groundwater close to the surface, well-drained but difficult to discharge soil formation (groundwater flooding area);

-No permanent groundwater tables, but areas that are difficult to flow to the outside depending on the natural conditions of the area (groundwater distribution zone).

Shreder and oht. (1968) argue that the surface irrigation and soil mechanical composition are the same, but different hydrogeological and land clearing areas have different irrigation regimes. {3}

The Hydromodul area is part of the soil improvement area and is closely related to the factors that determine the thickness of the soil layer, its mechanical composition, its location in the air zone, the location of its water-physical properties, groundwater level and irrigation order, norms and fluid dynamics. It is characterized by its proximity.

Table 2

CHART OF HYDRO MODULE ZONING

Number of hydro modul area	Soil condition	Groundwater level,м
I II III IV V VI VII VIII IX	Automorph soils Sand loam and thick sandy loam on sandy loam. Light loam located in mid-level loam and thick sandy loam and sandy loam Thick medium to heavy sand and mud Semi-automorph soil Chunks, medium and low thickness of clay and clay .Light and medium loam, heavy sand loam with one layer . Heavy loam stacked with the same layer and other mechanical contents. hydromorphic soil Sandy and Romi, sand and sand less than medium thick . Lightweight and medium loam, single layer, heavy loam. Heavy loam and clay are stacked in the same layer with different mechanical contents.	>3,0 -»- -»- 2-3 -»- -»- 1-2 -»- -»-

According to this zoning, the irrigation areas of the Khorezm region and the southern part of the Republic of Karakalpakstan belong to one soil climate zone-desert zone, three soil improvement zones within this zone.

These are:

-Pore soil with a groundwater depth of 3 meters;

-Semi-aqueous soil of 2-3 meters of groundwater;

-Amorphous soil of 1-2 meters of groundwater.

Currently, irrigation lands in the Khorezm region and southern regions of the Republic of Karakalpakstan can be divided into six types: IV, V, VI, VII, VIII and IX, depending on the thickness, mechanical composition, location and groundwater level.

Table 3

IRRIGATION LAND DISTRIBUTION IN SOME AREAS OF KHOREZM OASIS BY HYDROMODUL REGION

Region	Irrigation area, ming ga	Hydro module area					
		IV	V	VI	VII	VIII	IX
Khorezm region							
Gurlen	30.36	-	5,5	8,6	14,3	45,8	25,8
Shovot	28.98	-	10,3	9,2	15,9	43,7	20,9
Urganch	28.95	2,2	11,6	7,3	20,1	35,7	14,1
Yangibazar	23.77	2,5	5,6	5,4	17,3	46,1	22,1
Republic Karakalpakstan							
Beruniy	29.83	0,15	0,10	0,15	39,8	24,9	34,9

The irrigation areas of the Khorezm region and the southern part of the Republic of Karakalpakstan belong to three hydraulic zones: VII, VIII and IX under these conditions, field studies were carried out based on the PSUEAITI method for determining scientifically justified irrigation procedures for cotton.

Scientific research carried out in Shovot district farm of (Ergash Ruzimov) in IX hydromodul region's heavy sandy (Experiment 1) in Khorezm region, Beruniy district farm of (Reimbay Bashlik) in VIII hydromodul region's medium sandy (Experiment 2), Gurlan district farm of (Tulkin Mirzabek Aslbek) in VII hydromodul region's light sand of irrigation land (Experiment 3). Collector-drain networks are installed on all farmland, and irrigation systems are engineered. For agricultural irrigation, the fields are fed with horns and ditches, and the crops are irrigated with furrows. The soil on the farm is weak and moderately saline.

Field experiments were performed on the following systems.

Table 4

FIELD EXPERIMENT IMPLEMENTATION SYSTEM

№	soil moisture before irrigation, LFMC in relation to %	Irrigation standards , м3/га
1	Production Management	Real measurement
2	70-70-60	70-100-70 cm due to lack of moisture
3	70-80-60	70-100-70 cm due to lack of moisture
4	70-80-60	he lack of moisture in the 70-100-70 cm layer increased by 30%.

Soil volume weight in the experimental field. One of the main indicators that determine the structure of the soil layer is volume weight.

According to the results obtained in the experimental field for the soil volume of Experiment 1, when vegetation begins, the soil volume at the beginning of the growing season is 1.37 g/cm^3 in the 0-30 cm layer, 1.43 g/cm^3 (30-50 cm) in the underground soil It was. 1.41 g/cm^3 per 100 cm layer.

In Experiment 2, the volume of soil at the beginning of the growing season is 1.36 g/cm^3 in the 0-30 cm layer of plowed soil, 1.38 g/cm^3 in the soil soil (30-50 cm), 1.38 g/cm^3 in the 0-100 cm layer It was. He did.

In Experiment 3, the volume of soil at the beginning of the growing season was 1.32 g/cm^3 at 0-30 cm layer of plowed soil, 1.35 g/cm^3 at ground surface (30-50 cm), 1.33 g/cm^3 at 0-100 cm layer. He did.

Limited field moisture capacity in the experimental field. The limited field moisture capacity of the soil is the ability to absorb and retain a certain amount of water. Depending on the moisture storage conditions, strength and conditions in the soil, the water capacity is the maximum adsorption water capacity, the maximum molecular, capillary, full length and full water capacity.

According to field experiments, Experimental **Experiment 1** has a field moisture content limited to 22.4% of dry soil weight in 0-50 cm layers and 22.5% of soil moisture content in 0-100 cm layers. **In Experiment 2**, 21.1% in 0-50 cm layer, 21.4% in 0-100 cm layer, 19.6% in 0-50 cm layer, 19.3% in 0-100 cm layer. Formed.

Permeability of soil at experimental site. Permeability is one of the most important water-physical properties of the soil, which describes the soil's ability to absorb and transfer water to the bottom, which is called filtration. Permeability depends on the mechanical composition, structure, humus content and salinity of the soil. Soil permeability depends on the mechanical composition and water-physical properties of the soil, its structural state, density, porosity, humidity and moisture duration. The examined pasture soil showed average permeability according to Astapov S.V and its value varied with strain according to different irrigation procedures.

According to the results of soil moisture permeability in the experimental field, in Experiment 1, the soil moisture permeability at the beginning of vegetation was 996 m^3/ha or 0.277 mm/min for 6 hours.

At the beginning of vegetation in Experiment 2, the soil moisture permeability was 1292 m^3/ha or 0.359 mm/min for 6 hours.

At the beginning of the vegetation of Experiment 3, the soil moisture permeability was 1501 m^3/ha or 0.417 mm/min for 6 hours.

Irrigation of cotton. When growing crops, it is necessary to provide conditions for irrigation under certain climatic conditions and maintain a water system for each plant species. Crops respond differently to the biological conditions of cotton in terms of water availability. But in general, all plants have maximum yields if the water demand is constantly met throughout the growth and development period.

The irrigation rate is calculated by the formula:

$$m = 100 \cdot h \cdot J \cdot (W_{LFMC} - W_{rh}) + K \quad м^3/h$$

LFMC-soil weight-limited field moisture capacity,%;

rh- Real humidity before irrigation,%,% of soil weight;

J-volume soil weight, g/cm^3;

the value of the h-calculation layer, m;

water consumption for k-irrigation evaporation, m^3/ha (10% of insufficient moisture in the computed layer)

In the experimental field, the sprinkled noodles were irrigated according to the moisture content. During the growing season, the irrigation, timing and water supply differed considerably for each strain of cotton.

Table 5

IRRIGATION PROCEDURE OF COTTON IN THE EXPERIMENTAL FIELD

	Variants	Irrigation	1	2	3	4	5		Seasonal irrigation limit, $м^3$/h
1-experiment	1	term	08.07	03.08	30.08				3866
		limit	1345	1297	1224				
	2	term	07.07	30.07	23.08				3257
		limit	1101	1086	1070				
	3	term	08.07	26.07	17.08				2234
		limit	745	760	729				
	4	term	08.07	04.08	29.08				2905
		limit	988	969	948				
2- experiment	1	term	18.06	13.07	08.08	3.09			4678
		limit	1247	1126	1164	1141			
	2	term	20.06	14.07	06.08	03.09			3205
		limit	650	891	921	743			
	3	term	19.06	07.07	24.07	17.08			2854
		limit	643	663	693	855			
	4	term	18.06	08.07	30.07	25.08			3731
		limit	823	883	901	1124			
3- experiment	1	term	15.06	06.07	28.07	16.08	05.09		5222
		limit	1131	1012	1027	1034	1018		
	2	term	15.06	02.07	19.07	05.08	28.08		3832
		limit	620	813	827	820	752		
	3	term	17.06	01.07	14.07	28.07	12.08	02.09	3756
		limit	620	609	595	600	590	742	
	4	term	17.06	06.07	26.07	14.08	05.09		4116
		limit	792	774	792	780	978		

In recent years, the transition from paper to paper-based digital mapping is rapidly evolving with computer-based mapping technology using graphical information systems. Over time, if you frequently change many types of data, it is difficult to use simple paper cards. Today's automated systems can guarantee the reception and relevance of emergency information.

In this regard, modern GIS is an automated system that can transform spatial data into mapping, conclusions and monitoring, combine model and computational functions with a large number of graphical and topical databases, and work on them.

Computer literacy has grown considerably today. Cards made with GIS are different from simple paper cards with computer format, unimaginable accuracy and many other advantages.

You can change cards, add new content and paint, add diagrams and other information, delete them, and more.

This card making technology is a universal process today, the first, fairly universal, and second, it develops very quickly, covering human activities in all areas. Today, manufacturers and organizations are working hard to transfer cards and plans from paper to digital.

ARC GIS software is responsible for converting cards from paper to digital. We recommend that you use geographic information technology to create cards and plans using the following information. Plans including e-cards and ARC GIS:

-preparation. Initial data collection from electronic flowmeters and GRS devices, image processing tools, digital retrieval data, author sources, existing stock cards, etc;

-mapping and mapping of stock materials, raster images and placement in computer memory;

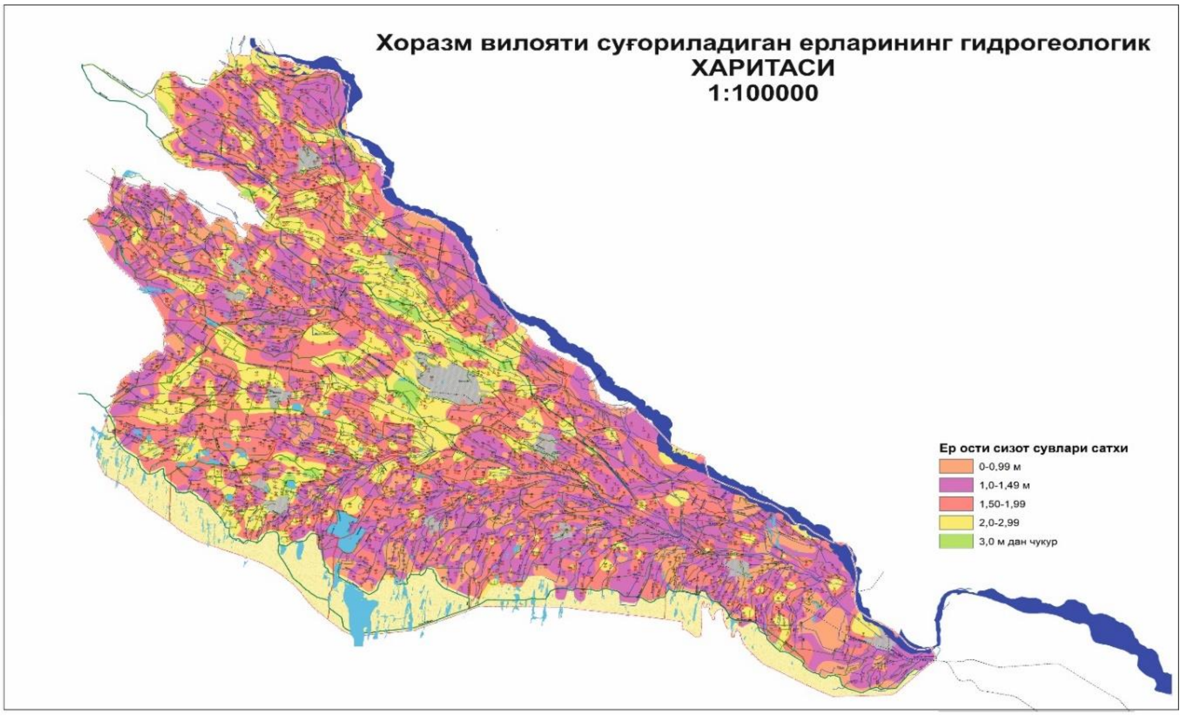
-To enter into the computer memory the scanned maps from GPS devices and plans of agricultural areas, raster images, aerial photos and survey results;

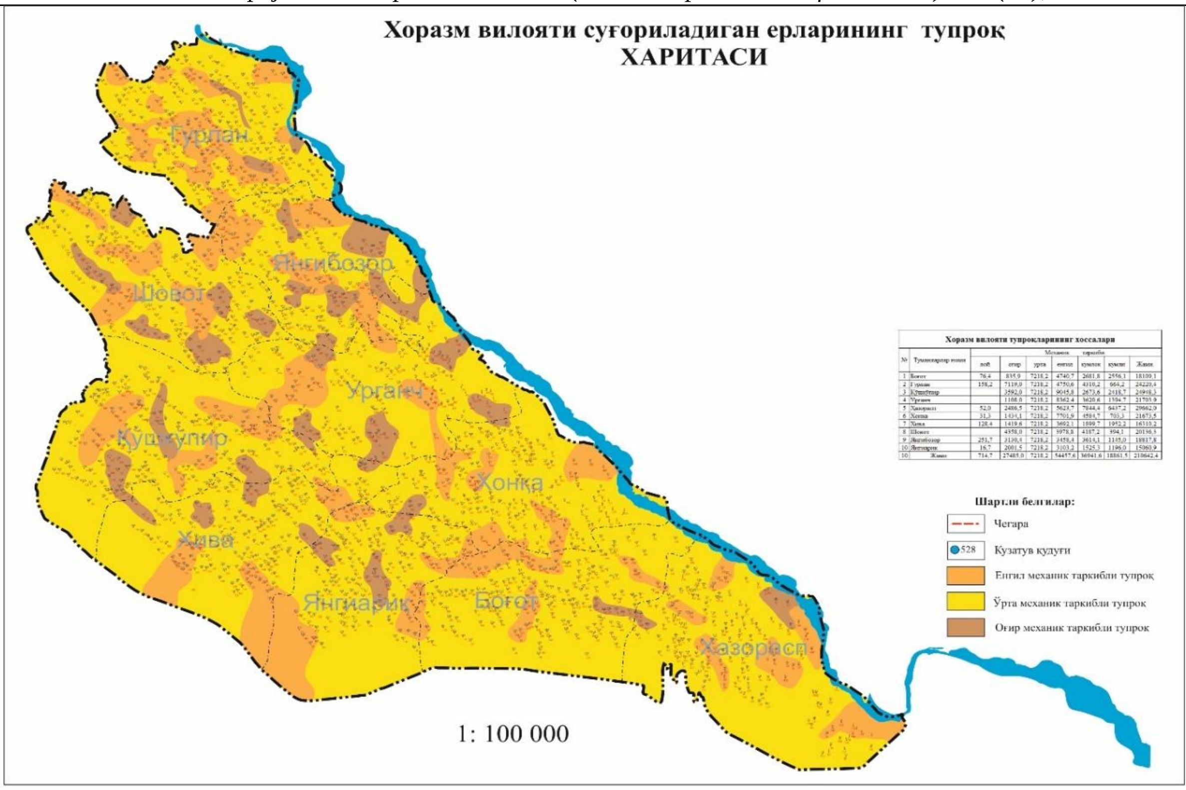
-Development and analysis of the subject layers, tables of cards to be created;

-Insert table (property) and text data into computer memory using database-generated object classification. Development and introduction of symbol systems;

-Include an overview map, borders of the farm, and information about the farm (year of farm establishment, point number, direction, etc.).

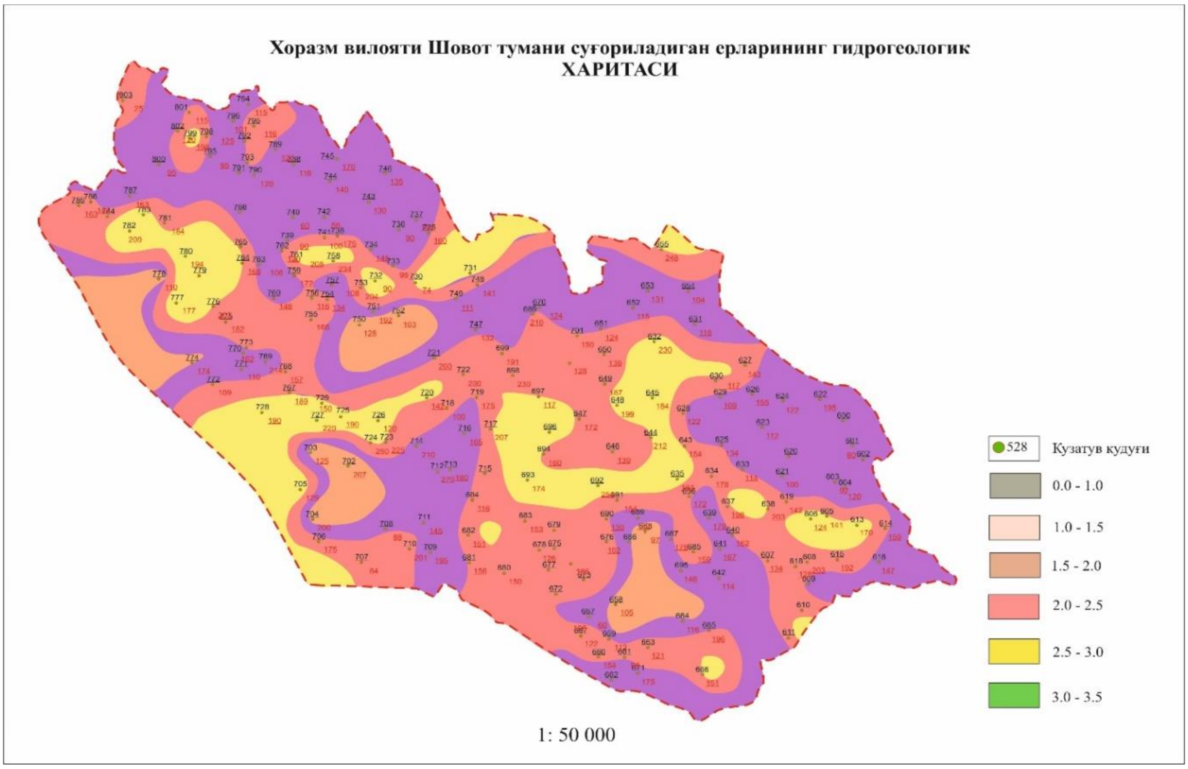
Electronic digital cards and plans can be used to study soil, groundwater resources, soil conditions in WUA, determine the order of irrigation of agricultural crops, and determine saline soils. You can also monitor your irrigation land using electronic maps and plans.

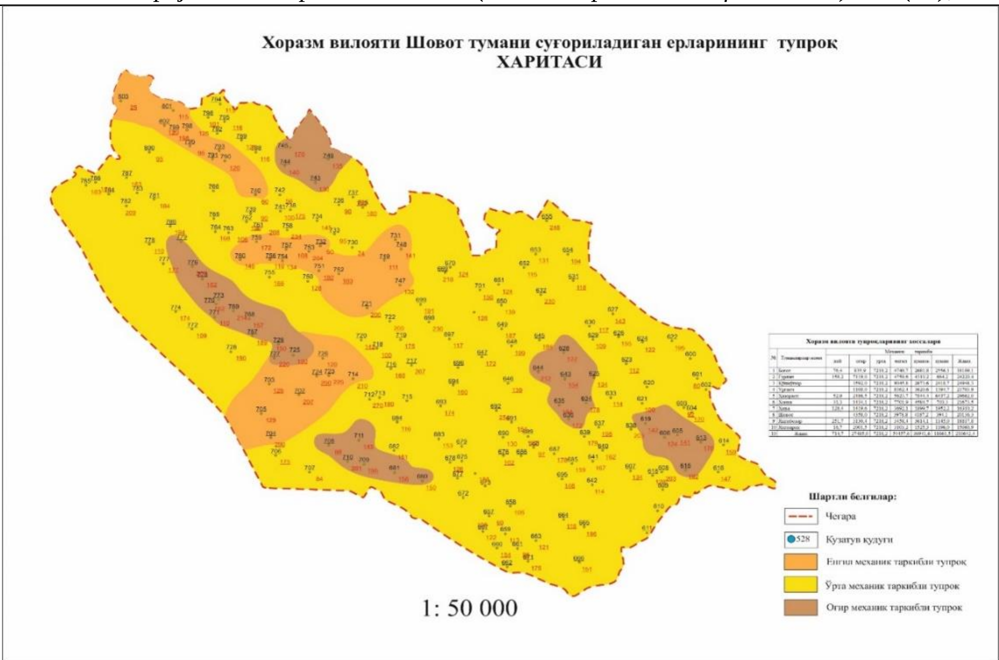




Хоразм вилояти тупроқларининг хоссалари

№	Туманларлар номи	Механик таркиби						
		лой	оғир	ўрта	енгил	қумлоқ	қумлик	Жами
1	Боғот	76,4	835,9	7218,2	4740,7	2681,8	2556,1	18109,1
2	Гурлан	158,2	7119,0	7218,2	4750,6	4310,2	664,2	24220,4
3	Қўшкўпир		3592,0	7218,2	9045,8	2673,6	2418,7	24948,3
4	Урганч		1108,0	7218,2	8362,4	3620,6	1394,7	21703,9
5	Хазорасп	52,0	2486,5	7218,2	5623,7	7844,4	6437,2	29662,0
6	Хонқа	31,3	1434,1	7218,2	7701,9	4584,7	703,3	21673,5
7	Хива	128,4	1419,6	7218,2	3692,1	1899,7	1952,2	16310,2
8	Шовот		4358,0	7218,2	3978,8	4187,2	394,1	20136,3
9	Янгибозор	251,7	3130,4	7218,2	3458,4	3614,1	1145,0	18817,8
10	Янгиариқ	16,7	2001,5	7218,2	3103,2	1525,3	1196,0	15060,9
10	Жами	714,7	27485,0	7218,2	54457,6	36941,6	18861,5	210642,4





Picture 1 Hydrological geology and soil map of Khorezm region and Shovot region drawn from modern program

Conclusion: In the study of the development of a scientifically justified cotton irrigation system in the alluvial soil of the ancient Correslem oasis, the following conclusions can be drawn:

1.Irrigation lands in the Khor Lam area and the southern part of the Republic of Karakalpaxtan, according to the primary hydro module zone, are associated with three soil mitigation zones, one soil climate zone-desert zone. In the irrigation land of the Khorezm region and in the southern part of the Republic of Karakalpakstan, there are six areas of IV, V, VI, VII, VIII and IX, depending on the thickness, mechanical composition, location and level of groundwater in the aeration layer. VIII and IX are hydro module regions.

2. In Experiment 1, cotton 3 irrigation moisture was 70-80-60% more than LFMC in case 3, and cotton was irrigated three times during the flowering period of the 0-3-0 scheme at 729-760 m^3 / ha. Seasonal irrigation rates were 2234 m3 / ha or the highest cotton yield was used, 1632 m^3 / ha less water than the control.

In Experiment 2, in the case of cotton irrigation, the soil moisture before irrigation was 70-80-60% compared to LFMC in case 3, and during the flowering period the cotton was irrigated to 643 m3 / ha; Cotton was irrigated twice with an irrigation standard and harvested once with 855 m^3 / ha irrigation during the ripening period. Seasonal irrigation rates saved 3205 m3 / ha or 1473 m3 / ha rivers and showed higher cotton production than the control strain.

In Experiment 3, the moisture content before cotton 3 irrigation was 70-80-60% higher than that of LFMC in Case 3, with 620m3 / ha during flowering and 590-609m3 / ha during flowering. Cotton was irrigated 4 times with an irrigation standard and 1 time with 742 m3 / ha during ripening. Seasonal irrigation rates were 3756 m3 / ha or 4,666 m3 / ha compared to the control strain, showing higher yields and higher cotton yields.

3.In Case 1 of cotton irrigation, soil moisture pre-irrigation shows a higher yield of 40.3 c / ha than option C, which is 70-80-60% higher than LFMC. This is 4.1 c / ha more than the control option, and the lowest water consumption of 1 cent: 55.4 m3 of river water.

In Experiment 2, the best results came from Option 3. Productivity is 38.2 t / ha, 3.8 c / c higher than the control, the minimum water consumption is 74.7 m3 per cent.

In Experiment 3, cotton irrigation had a yield of 35.5 centners per hectare, which was 3.9 cents more than the control and kept the soil moisture content before irrigation to 70-80-60% for LFMC while maintaining a minimum yield for 1 cent of cotton. Keep it. : 105.8 m3 of river water has been discharged.

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