European Science Methodical Journal
ISSN (E): 2938-3641
Volume 2, Issue 4, April - 2024

ECOLOGICAL CONDITION OF IRRIGATED LANDS IN DO‘STLIK DISTRICT, JIZZAKH REGION

Safarov Anvar Abdinazarovich,
Teacher of the Department of Natural
Sciences of Uzbekistan State World Languages University
E-mail: anvarsafarov170@gmail.com

Muxammadiyev Jasur Mardon o‘g‘li,
Teacher of the Department of Natural
Sciences of Uzbekistan State World Languages University
E-mail: jasurmarqayev24@gmail.com

Rashidova Sitora Xo‘jayor qizi
Student of Uzbekistan State World Languages University
E-mail: sitorarashidova2024@gmail.com
Based on the review of J. Mirzayev, associate professor of Uzbekistan National University

Abstract:

This article presents information on the ecological condition of soils based on the results of research on the impact of anthropogenic and natural factors on irrigated lands in Do‘stlik District, Jizzakh Region.

Keywords: Irrigated lands, anthropogenic, natural, factor, ecological condition, soil fertility, agriculture, food products, productivity.

Introduction

Providing the growing population with ecologically clean, that is, high-quality food products is one of the most urgent issues of today. This, in turn, depends on the ecological condition of the land used in agriculture, which produces high-quality food for people. Over the years, as a result of anthropogenic and natural factors affecting agricultural lands, soil salinity and soil erosion have been increasing. As a result, the ecological condition of the soil deteriorates and the fertility of the soil decreases. This situation leads to a decrease in the productivity of agricultural crops. As a result, it has a negative impact on providing the growing population with ecologically clean and high-quality food products.

The ecological condition of irrigated lands in Do‘stlik district of Jizzakh region was chosen as the object of research.

In the last century, soil salinization accounted for 33% of irrigated land on earth. One of the main causes of soil salinization is the use of excessive chemical fertilizers in the cultivation of agricultural crops, irrigation with water with a high sodium content, and the lack of sufficient drainage facilities [1]. The main reason for soil salinization is excessive irrigation of agricultural crops. When analyzing some of the main ions that negatively affect the quality of

irrigation water, it was found that the content of elements such as boron, chloride and nitrogen is high in irrigation water. In order to prevent soil salinization, it is necessary to control the quality of irrigation water [2]. Nowadays, soil salinization and solidification processes are widespread. The main sources causing these processes are natural and anthropogenic factors. Natural factors include factors such as climate, lithology, topography, and soil science, while anthropogenic factors include the improper use of agricultural land by humans. Under the influence of natural and anthropogenic factors, the soil has become salinized, which has led to the deterioration of the land and the acceleration of the desertification process, as well as a decrease in the productivity of agricultural crops. As a result, the safety of ecologically clean and quality food products is threatened [3].

Currently, under the influence of natural geochemical and anthropogenic factors, about 1 billion hectares of the world's land surface has been exposed to salinity, which is about 7% of the earth's surface. Soil salinity is increasing as a result of the intrusion of saline water into coastal areas due to climate change and the increase in the water demand of crops, as well as the use of low-quality water for crop irrigation [4]. A number of scientists have conducted research on the salinity level of irrigated soils in the Syrdarya region through GIS. According to the results of the research, as of October 1, 2017, 7,059 irrigated fields were saline. Of these cultivated areas, 223,727 ha are weakly saline, 50,222 ha are moderately saline, and 5,486 ha are strongly saline [5].

Materials and research methods

In Jizzakh region, the Lower Syrdarya Irrigation Systems Basin Department (ISBD) under the Ministry of Water Management monitors the amount, quality (mainly mineralization) and salinity of soil.

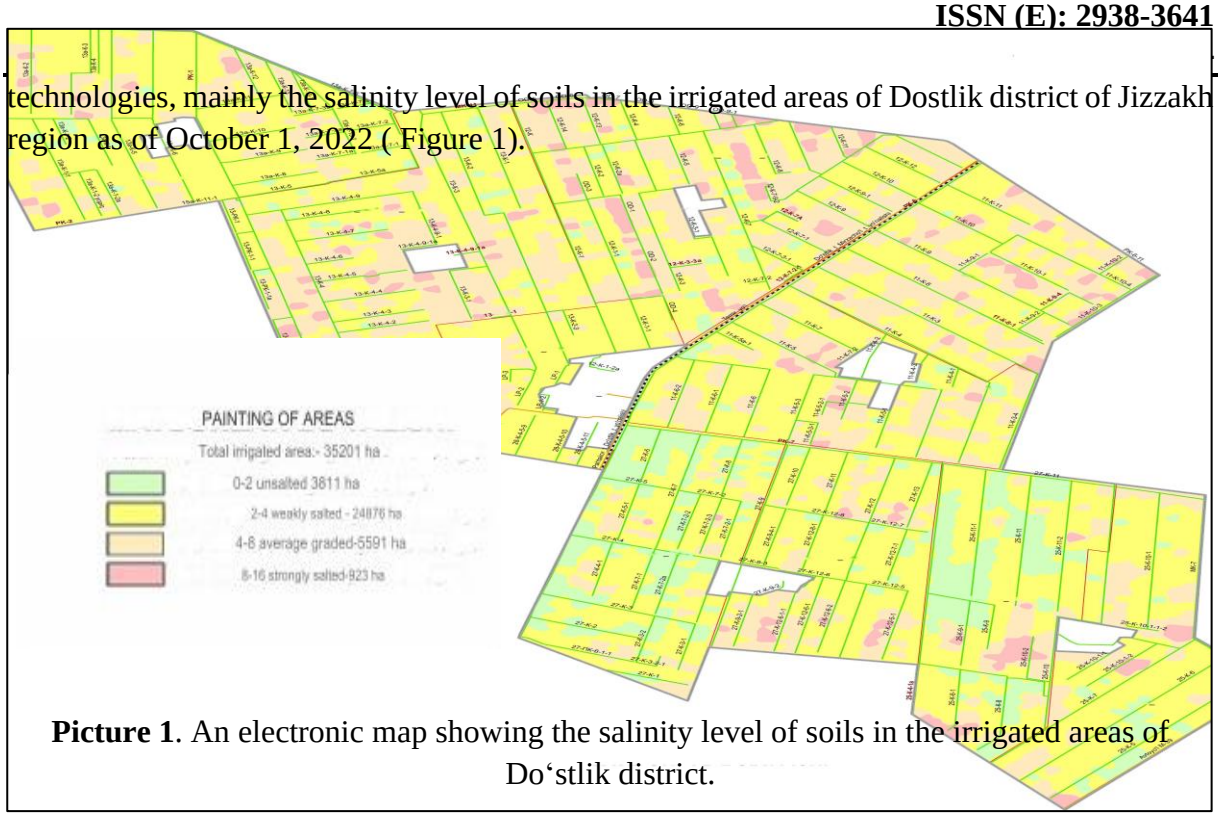
A special field expedition was organized in October 2022 by the authors of the article and specialists of the Lower Syrdarya ISBD in research work, and samples were taken from the soil of the Regional Association of Farms of the Dostlik district.

The obtained samples were determined by the laboratory of the Lower Syrdarya Irrigation Systems Basin Administration (ISBD).

The obtained results and their discussion.

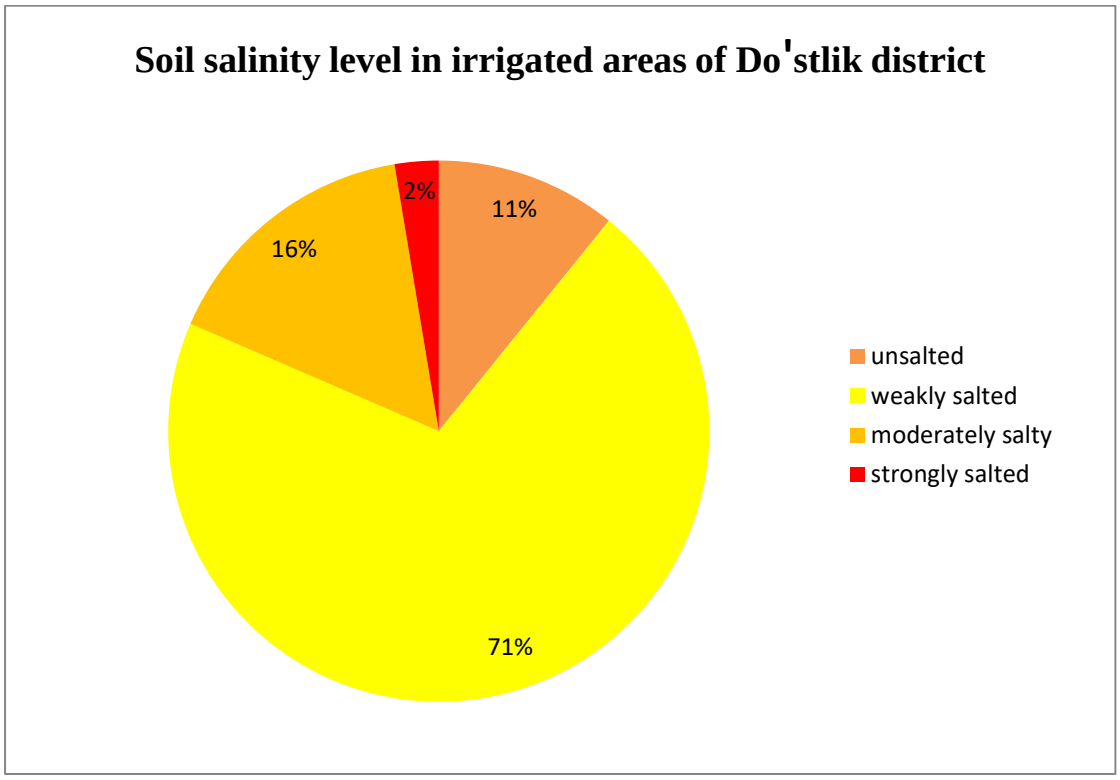
Determining the ecological condition of the lands used in agriculture, that is, assessing the level of soil salinity, land reclamation, and productivity indicators, regularly monitoring to prevent a decrease in crop productivity and increase its economic efficiency, requires complex processes. In alleviating such cases, the use of GIS does not require a long time and does not require a lot of money. The results obtained through Geographical Information Systems (GIS) are bearing fruit today. Monitoring, evaluation and analysis through GIS is gaining great importance in determining the ecological status of many regions. GIS information about the ecological state of the Earth requires rapid updating, because the processes occurring on Earth are dynamically changing. Information that changes from time to time in GIS gives us the opportunity to receive new information and analyze it. Taking into account these advantages, an electronic map of the area was created based on the results obtained by applying GIS

technologies, mainly the salinity level of soils in the irrigated areas of Dostlik district of Jizzakh region as of October 1, 2022 (Figure 1).



Picture 1. An electronic map showing the salinity level of soils in the irrigated areas of Do‘stlik district.

As of October 1, 2022, the salinity levels of the irrigated lands of Dostlik district of Jizzakh region are also presented in the diagram below (picture 2).



Picture 2. 2022 Soil salinity level in irrigated areas of Do‘stlik district.

According to the analysis of the results obtained from the following electronic map and diagram, 11% of the total irrigated area of 35,201 ha in Do‘stlik district of Jizzakh region, i.e. 3,811 ha is not saline, 71% and 24,876 ha are weakly saline. It was found that 16% of the 5591 ha area is moderately saline and 2% of the 923 ha area is strongly saline (Fig. 2).

There are 12 regional associations of farmers in Do‘stlik district. The level of salinity of the total irrigated lands in the district was studied in the area of "FAOF". The data studied are presented in Table 1 below.

If it is analyzed in the section of "FAOFs", 34% of the Manas farm area and 40% of the Abduvosiyev farm area were non-saline areas, which is more than other " FAOF " areas. indicates an excess of fields.

Table 1

O/n	FAOF’s names	Total irrigated area (ha)	Including:			
			Unsalted (ha)	Lightly salted (ha)	Medium salted (ha)	Strongly salted (ha)
1	Oq-oltin	3095	115	2355	570	55
2	Xalqobod	3233	20	2378	710	125
3	A. Sarkisov	4627	205	3002	1120	300
4	K.Rahimov	4493	225	3103	1010	155
5	M.Dadajonov	4551	150	3726	610	65
6	Manas	3250	1115	1800	235	100
7	A.Kulbekov	2948	310	2268	335	35
8	X.Isroilov	2783	150	2203	375	55
9	Abduvosiyev	3236	1290	1760	176	10
10	Navbahor	1369		1269	100	
11	Istiqlol	1439	231	835	350	23
12	Another organization	177		177		
	District by district	35201	3811	24876	5591	923

According to the data presented in the table, it was found that the soils in the area of the A. Sarkisov farm in the district are the most saline, and the soils in the area of the Istiklal farm are the least saline.

Conclusions

11% of the total irrigated area in Do‘stlik district of Jizzakh region is not saline, 71% is weakly saline, 16% is moderately saline, and 2% is strongly saline.

If it is noticed to the section of "FAOFs" in Do‘stlik district, there are no unsalinated areas in Navbahor farm and other organization areas, but these areas are not strongly saline, i.e. weakly or moderately saline. It turned out.

In terms of irrigated areas in Do‘stlik District, the largest highly saline area was found in the Sarkisov farm and is 300 ha.

Resources

1. Mohanavelu A., Raghavendra S.N., Al-Ansari N. Irrigation-induced salinity and salinity hazards of soil and groundwater: a review of its causes, consequences and mitigation strategies // MDPI Journal List. 2021.
2. Saadu U.V., Murtala A.G., Kabiru D.U., Aminu A., Abdullahi U. Understanding the causes, consequences and management of salinity in irrigated fields: a review // International Journal of Agriculture and Animal Production. 2021.
3. Stavi I., Tevs N., Priori S. Soil salinity and salinity in arid areas: review of causes, consequences, monitoring and restoration measures // Front. Environment. Sciences, August 11, 2021.
4. Hopmans Y, Qureshi A, Kisekka I, Manns R, Grattan SR, Rengasamy P, Ben-Gal A, Assouline S, Javeau M, Minhas P, Raats P, Skaggs T. Wang G. Chapter One. Critical knowledge gaps and research priorities in the field of global soil salinization // Advances in agronomy. 2021. S.- 1-191.
5. Ruziev I.M., Nazaraliev D.V., Omonov I, Mirzakarimov V. Development of changes in soil salinity in the Syrdarya region using geographic information systems (GIS) // Journal of architecture, engineering and modern technologies ISSN: 2181-3469 Volume: 02 Issue: 2023.
6. Mirzayev J.A., Kulmatov R.A. Improving the amount and quality of collector drainage from irrigated areas and their use (in the example of Jizzakh region). News of UzMU, 3/2, 2019, pages 101-108.
7. R.Kulmatov. J. Mirzaev., J.Abuduwaili., B.Karimov. Challenges for the sustainable use of water and land resources in the Djizakh irrigation zone (Uzbekistan) under changing climate and salinization. Journal of Arid Land (2020) 12(1): pp. 90–103. https://doi.org/10.1007/s40333-020-0092-8.
8. R.Kulmatov., J. Mirzaev., D.Kulmatov., R. KH. Allaberdiyev. The modern agroecological (rivers water, irrigated lands) problems of Uzbekistan under the climate change with focus of the Navoi region. International conference on Integrated innovative development of Zarafshan region: achievements, challenges and prospects. 27-28 November 2019, Navoi. pp. 726-732
9. Alibekov L.A., Nishonov S.A. Natural conditions and resources of Jizzakh region. "Uzbekistan" publishing house, 1978.
10. Mirzayev J.A., Kulmatov R.A, Taylokov A. "Use of water and irrigated land resources of Jizzakh region under climate change" information-analytical and scientific-practical magazine, 2018, issue 9(209), pages 26-30.