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CONDITION OF DESERT PASTURES

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Abstract
This article summarizes the results of geobotanical research conducted in the territory of Bukhara region of the Republic of Uzbekistan in 2018-2021. Studies identified degradation processes occurring mainly in pasture lands. In particular, over the past 26 years (compared to 1992), the average vegetation cover in desert pastures has increased from 47% to 45%, as well as the average yield from 2.1 c/ha to 1.9 c/ha (-0.3 c/ha) and the share of land per 1 conditional head of cattle increased from 28.0 hectares to 32.4 hectares (+4.4 hectares).

Keywords: Pasture lands of Bukhara region, desert region of the Republic of Uzbekistan, geobotanical researches, degradation processes, pasture vegetation, average yield, fodder unit.

Introduction

"Pastures make up 25% of the world's land area, and in arid regions, various degradation processes are observed in pastures" [17; www.un.org/russian/ga/unep]. Therefore, it is important to prevent the ongoing degradation of pasture lands, restore the productivity of pasture lands and their efficient use.
Natural pastures and hayfields of the republic are an important natural source in meeting the needs of the population in meat and dairy products [6; 91-97-p.].
20.2 million hectares of land in the country are used for agricultural purposes. Its 11 million hectares are pastures. According to the Samarkand Research Institute of Karakul and Desert Ecology, 42% of these pastures have been degraded. In order to prevent erratic use of pastures, the Law "On Pastures" [1; 10-p] was passed.
These issues are one of the most pressing issues today, the development of science-based land management projects aimed at eliminating the negative impacts on pastures, the rational use of pasture lands, their protection, restoration and enhancement.

The object of research is the pastures of Bukhara region in the desert region of Uzbekistan.

Research Methods

The research is generally accepted methodological guidelines in practice [2; 43-p., 3; 108-p., 4; 18-p., 5; 36-p., 7; 81-p., 10; 160-p]. Geobotanical research In the field work carried out in Karakul district of Bukhara region, 105 main and 130 additional plant description books were compiled, 105 transects were created for shrubs, semi-shrubs and large grasses, 180 harvest areas for small grasses were identified.

Research Results and Discussion

In the context of globalization of the world economy and population growth, it is necessary to move to sustainable environmental management and rational use of natural resources [9; 928-p.].

Pasture lands, which fall into the category of agricultural lands, are mainly used for livestock. In many countries around the world, this area of agriculture is an important sector, and a large part of the pastures as a source of natural food has a significant impact on the socio-economic development of the regions. Monitoring the condition of pastures helps us detect changes early. Therefore, monitoring of pasture lands allows to identify and manage adverse conditions in pastures.

The state of pastures of the country, the causes and extent of their degradation, the need to improve socio-economic and environmental conditions and the issues of sustainable pasture use are relevant [12; 163-173-p., 13; №3 (167), 41-45-p., 14; 302-306-p., 15; №11, 34-35-p.].

The main areas of pastures and hayfields are attached to forestry. Geobotanical research in these areas has been virtually non-existent for the past 30 years. The fact that no pasture monitoring has been carried out has not been updated, which clearly analyzes the condition of pastures and changes in them.

Article 8, paragraph 8 of the Law of the Republic of Uzbekistan "On Pastures" [1; 10-p.] specifies the monitoring of pastures, the main purpose of which is to assess the condition of permanent pastures.

According to the land report as of January 1, 2021, the total area of natural pastures and hayfields in the country is 21.1 million hectares, which is 46.6% of the total land area, of which 18.6 million hectares are irrigated pastures and hayfields [6; 91-97-p.]. According to the distribution of pastures and hayfields in the Republic of Karakalpakstan and the regions, the lowest pasture area is in Syrdarya region - 19.9 thousand hectares (0.1%), Andijan - 21.1 thousand hectares (0.1%), Fergana - 23.5 thousand hectares (0 , 1%), the largest area of pastures in Navoi region is 8893.3 thousand hectares (41.9%), followed by the Republic of Karakalpakstan in terms of area with 5257.3 thousand hectares (24.7%) [6; 91-97-p.].

Natural pastures and hayfields are characterized by their vegetation. Therefore, in their study it is necessary to determine the composition of plants, to study the nutritional aspects.

Our geobotanical researches were carried out on 276,804 hectares of land in Karakul district of Bukhara region, covered with pastures of “Karakul” LLC, “Tashkent”, “Kuvacha”, “Bukhara”, “Ziyorat”, “Paykent” and E.Rakhimberdiev massifs (Table).

105 field and 130 additional plant description books were compiled, 105 transects for shrubs, semi-shrubs and large grasses were compiled, 180 harvest areas for small grasses were identified during field works in Karakul district.

Pasture occupies the lower desert rung according to vegetation cover. At this stage, the pasture group, pasture type and pasture types belonging to this or that soil type were identified.

According to the living conditions and floristic composition of forage and plants in the district, 3 pasture groups, 7 pasture types and 32 pasture species were allocated (Table 1).

The studied area is located at an average altitude of 200 meters above sea level and is mainly occupied by sandy and loamy desert soils.

The average level of vegetation in the district is 45%, of which the minimum is 36% in the area of "Ziyorat" and the maximum is 52% in the territory of "Karakul" LLC. Perennial grasses, shrubs, semi-shrubs and ephemeral-ephemeroids grow in the area. There are a total of 32 species of pasture plants in the district, of which 28 to 34 are edible plants, and 13 to 19 are non-edible, harmful, poisonous and non-edible plants (Table 1).

According to the analysis, the lowest occurrence of pasture plants in the massif "Ziyorat" is 2 species. Up to 26 species of pasture plants can be found on the territory of "Karakul" LLC.

According to the composition of the vegetation cover, the district pastures are 3 seasons, and in years with favorable weather conditions, it is recommended to use these areas for livestock in other seasons.

Livestock water supply is mainly at the expense of well water. There are 584 wells in the pastures of the district, of which 365 are in good condition and 219 are in poor condition. In general, the water supply of livestock and pastures in the area is unsatisfactory, and if the faulty wells are repaired, it will be possible to accommodate additional livestock.

The study revealed that a total of 10% of the existing pastures in the district have been degraded to varying degrees under the influence of humans and livestock (Table 1).

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Table 1 The results of geobotanical research conducted in the pastures of Karakul district of Bukhara region

No.	Object name (massif)	Total land area, ha	Pastures and hayfields													Pasture area required for 1 conditional head of cattle, ha	The previous year of geobotanical research	Yield, c/ha	Number of pasture plants, pcs	Pasture area required for 1 conditional head of cattle, ha
			hence							number of plants			edible plants							
			area, ha (pasture)	pasture, ha	degraded area, ha	degraded area, in %	group	class	type	hence total	hence number of edible plants, pcs	hence number of plants that are harmful, poisonous and not eaten by livestock, pcs	yield, c/ha	feed unit, c/ha	Vegetation cover, %					
1	"Karakul" LLC	467537	265738,5	239240,05	26498,45	10,0	3	7	26	34	15	19	1,9	1,1	52	31,6	1992	2,1	51	28,6
2	Tashkent	3070,63	938,2	829,37	108,83	11,6	2	3	5	28	13	15	1,8	1,1	42	33,3	1992	2,1	42	28,6
3	Kuvacha	4384,23	1451,1	1308,89	142,21	9,8	2	4	7	31	18	13	1,9	1,2	45	31,6	1992	2,2	47	27,3
4	Bukhara	6623,54	1786,8	1567,02	219,78	12,3	2	5	6	31	16	15	2,0	1,2	48	30,0	1992	2,3	47	26,1
5	Ziyorat	2143,5	518	439,26	78,74	15,2	1	2	2	33	16	17	1,7	1,1	36	35,3	1992	2,0	50	30,0
6	Paykent	3059	1482	1313,05	168,95	11,4	2	4	5	32	17	15	1,8	1,1	44	33,3	1992	2,1	48	28,6
7	E.Rakhimberdiev	8876,7	4889,9	4371,57	518,33	10,6	2	4	7	30	16	14	1,9	1,1	50	31,6	1992	2,2	45	27,3
District total / District average		**495694,6**	**276804,5**	**249069,22**	**27735,28**	**10,0**	3	7	32	**32**	**25**	**23**	**1,9**	**1,1**	**45**	**32,4**		**2,1**	**47**	**28,0**

The average dry yield of forage crops in the district is 1.9 centners per hectare, and the average feed unit is 1.1 centners per hectare.

Due to the rarity of pasture species (average 2-5) in the massifs "Ziyorat", "Tashkent" and "Paykent", the average yield of forage pastures in these areas in terms of dry mass is 1.1 centners per hectare. The maximum values are recorded in the "Kuvacha" and "Bukhara" massifs, around 1.2 c/ha.

Based on the above, it was determined that the average required pasture area for 1 conditional head of cattle in the district is 32.4 hectares.

The figure below shows a 1: 100 000 scale geobotanical pasture map for the Karakul LLC in Karakul district.

In 1992, geobotanical surveys conducted in the Bukhara region recorded 47 species of pasture plants in the Karakul district. By 2018, 32 plant species were recorded and 15 plant species were not encountered.

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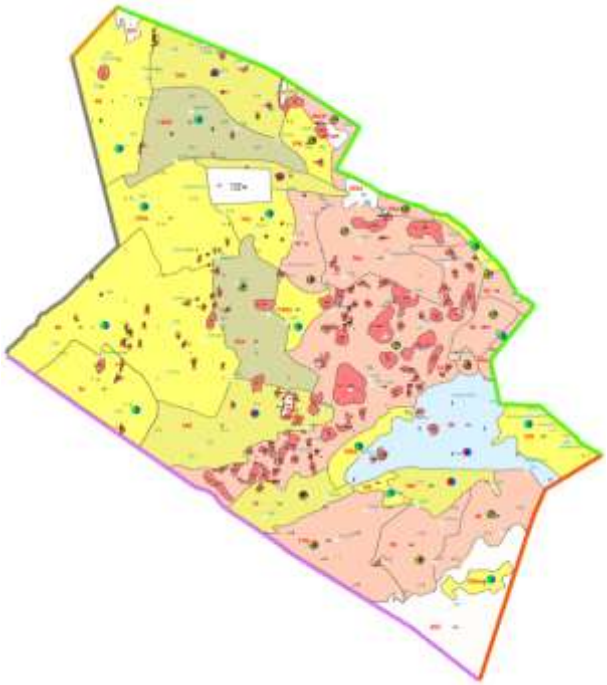

Figure. Pasture geobotanical map of “Karakul” LLC massif of Karakul district (2018, scale 1: 100 000).

In this regard, geobotanical studies conducted by the State Scientific and Design Institute “Uzdaverloyiha” have shown an increase in the area of non-grazing plants "Peganum hármala" and "Red Burgan" (Artemisia seoparia), and in some places with "Isirik" pasture types have been formed [10; 68-p.].

In 1992, pasture crop yields averaged 2.1 c/ha, while in 2018 they decreased by 0.3 c/ha to 1.9 c/ha. Correspondingly, the average coverage of pasture vegetation was 47%, while in 2018 it was 45% and decreased by 2%.

In general, the average crop yield in desert pastures decreased from 2.1 c/ha to 1.9 cha (-0.3 c/ha), and the share of area per 1 conventional head of cattle increased from 28.0 hectares to 32.4 hectares (+4.4 hectares) (Table 1).

In accordance with M. I. Ruzmetov’s study, [10; 68-p., 11; 1-p] the main cause of degraded areas and low crop yields in desert pastures are:

- Saxaul (Halaxylon persicum), Juzgun (Calligonum microcarpum) and Cherkez (Salsola Richteri) plants, which have low nutrient content in desert pastures and are not fully eaten by livestock;
- This is explained by the fact that in the desert pastures there is a process of replacement of pasture species consisting of forage plants with non-grazing types of pastures "Yulgunli", "Isirikli".

Evaluation of the degree of vegetation cover and productivity of pastures B.A.Dospekhov's equation [8; 351-p] was analyzed mathematically and statistically

using Microsoft Excel. Karakul district was rated as “low” in terms of desert pastures (Table 2).

Table 2 Mathematical-statistical analysis of the condition of pastures

n	Degree of vegetation cover, %					Average yield, c/ha					Pasture condition assessment
	X	S	V	Sx	Snx	X	S	V	Sx	Snx	
"Korakul" LLC											
1-9	**52,00**	2,74	5,27	0,27	0,53	**1,92**	0,22	11,27	0,02	1,13	Low
“Tashkent”											
1-5	**41,80**	3,03	7,26	0,30	0,73	**1,80**	0,25	14,16	0,03	1,42	Low
"Kuvacha"											
1-5	**45,00**	4,42	9,81	0,44	0,98	**1,90**	0,22	11,77	0,02	1,18	Low
“Bukhara”											
1-5	**47,80**	4,55	9,52	0,45	0,95	**2,04**	0,18	8,90	0,02	0,89	Low
“Ziyorat”											
1-5	**35,80**	6,53	18,25	0,65	1,83	**1,70**	0,19	11,00	0,02	1,10	Low
“Paykent”											
1-6	**44,00**	5,10	11,59	0,51	1,16	**1,80**	0,23	12,67	0,02	1,27	Low
E.Raximberdiev											
1-6	**49,83**	5,78	11,59	0,58	1,16	**1,92**	0,15	7,68	0,01	0,77	Low

Note: **X-** the average value of the indicators; **S-** standard deviation;
V- coefficient of variation; **Sx-** average mistake; **Snx-** average relative mistake.

In the mathematical and statistical analysis of the studied pastures, the minimum average error in terms of average yield is 0.01% in the pastures named after E. Rakhimberdiev, the maximum is 0.03% in the pastures of the Tashkent massif. Similarly, the vegetation cover rate ranges from 0.27 to 0.65 percent. Hence, the average mistake rate is interpreted as less than <1.

Conclusions, Suggestions and Recommendations

1. In 1992, geobotanical surveys conducted in the Karakul district identified 47 species of pasture plants. By 2018, 32 plant species were recorded and 15 plant species were not encountered. Correspondingly, the average coverage of pasture vegetation was 47%, while in 2018 it was 45% and decreased by 2%.
2. In desert pastures, crop yields decreased on average from 2.1 c/ha to 1.9 c/ha (-0.3 c/ha), and the area per 1 conventional head of cattle increased from 28.0 hectares to 32.4 hectares (+4.4 hectares). These cases indicate the need for proper organization of the livestock exchange system in the region.
3. It is advisable to conduct regular monitoring of natural vegetation and land to prevent and eliminate degradation processes in pastures.

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