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**CURRENT STATE OF DESERTIFICATION OF WINTER PASTURES
IN THE KURA BASIN**

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It was determined that the semi-desert and dry-steppe landscapes of the area are subject to overloading in the winter months of the year, and the rural grazing areas throughout the year due to their poor stability. As a result of this process, in semi-desert and dry-steppe landscapes with low natural recovery properties, erosion-denudation, development of salinization processes, change of plant species composition, surface physical fragmentation, soil compaction, reduction of soil-vegetation bio-productivity occur which appear as hotbeds of desertification.

Keywords: landscape, livestock, grazing, loading, soil-vegetation, desertification.

Agriculture and livestock are the main occupations of the population in the studied Kura basin. A wide expanse of semi-desert and dry steppe landscapes is the principal fodder source for livestock.

The rapid development of this area over the last 20 years has led to the overloading of the area with winter pastures consisting of semi-desert, arid landscapes. The winter pastures of the area consisting of semi-desert and arid landscapes have been overloaded as a result of the area's rapid development over the last 20 years.

After the dissolution of collective farms, land reforms, and the distribution of land among private owners in the mid-1990s, this procedure has become increasingly widespread in our country. In this regard, the Kura basin is the Republic's greatest agricultural region. Furthermore, because the study region is used for agricultural and winter pastures throughout the year, various environmental issues have arisen, including substantial anthropogenic desertification.

The studied area has the largest winter pastures in the country, the Jeyranchol-Ajinohur lowlands, Shirvan, Karabakh, Mil-Mugan, Salyan, and South-Eastern Shirvan plains are the main centers of animal husbandry. These lands are also used as winter pastures by the republic's mountainous regions, in addition to the animals kept by the local population. Mainly small horned animals graze in these winters for 6-7 months of the year, providing up to 50 % of the annual demand for food.

Overgrazing and year-round grazing are both considered hazardous circumstances that lead to desertification. Desert foci occur as a result of overcrowding and uninterrupted grazing, leading to the degradation of bio components in semi-desert and arid steppe landscapes, which are characterized by low resilience.

In the studied area the main forage resources of the grazed semi-desert and dry-steppe landscapes are worm-wood, sagebrush, blackberry, licorice, agate, meadow, ephemeral and xerophytic shrubs of different types.

65 % [1] of the country's natural forage areas are concentrated in the Kura Basin, mainly semi-desert landscapes. Their productivity is 0. 8-6. 9 s / ha, having the lowest biodiversity and bioproductivity after the nival and subnival zones of Azerbaijan [4, 6]

Year by year increase in the number of livestock and their overgrazing in pastures leads to the development of exodynamic processes (ravines, field erosion, wind erosion, erosion meadows of various sizes, etc.) leading to the development and acceleration of desertification. Grazing in winter pastures of Jeyranchol-Ajinohur lowland, central, north-eastern and eastern part of Shirvan plain, South-Eastern Shirvan (except Shirvan National park and Shirvan Reserve created in the area) Central Mugan, Mil-Garabagh, Salyan plains has led to the formation of desertification centers of various

degrees as a result of. changes in the species composition of plant groups, a decrease in their number, and their complete disappearance in many areas.

Our observations in the winter pastures of the study area show that the unsystematic grazing and overloading of pastures, along with the physical degradation of the surface, led to negative changes in the species composition and quality of the plants that make up the pastures. The number of forage plants has decreased in the areas where grazing is carried out throughout the year (completely disappearing in some areas), but the number of thorny, poisonous, hairy, pungent, coarse-stemmed plant species, which are not eaten by cattle and differ in morphological features, has increased. Due to the fact that the plants are well eaten by cattle, these inedible plant species increasing their range from year to year are characterized as the main indicators of desertification.

Along with the rapid development of livestock, the long-term occupation of the Lesser Caucasus pastures (up to 250,000 hectares) by Armenia and the rise in the Caspian Sea (about 50,000 hectares of winter pastures along the coast were. under the sea waters) and a total reduction of more than 300,000 ha of pastureland impacted the increase of. the number of livestock per unit area in the Kura Basin Cattle and small ruminants to be grazed in these areas are currently housed in the winter pastures of the study area.

The expansion of the area of desertification centers year by year created as a result of livestock grazing (such areas are wider on the plains of Jeyranchol, the Kura-Araz lowland), leads to a decrease in fodder crops. Since this process also affects other pastures, the number of livestock per hectare is increasing.

The results of our calculations based on the data of [2, 3] the State Statistics Committee show that the number of large and small cattle in the study area was 3177267 in 1995, this number was 4611517 in 2000 and 6191000 in 2005. In 2010 it was 6655348, in 2015 it was 7117100, and in 2020 it was 7115687, which is reflected in the graph below (Figure 1).

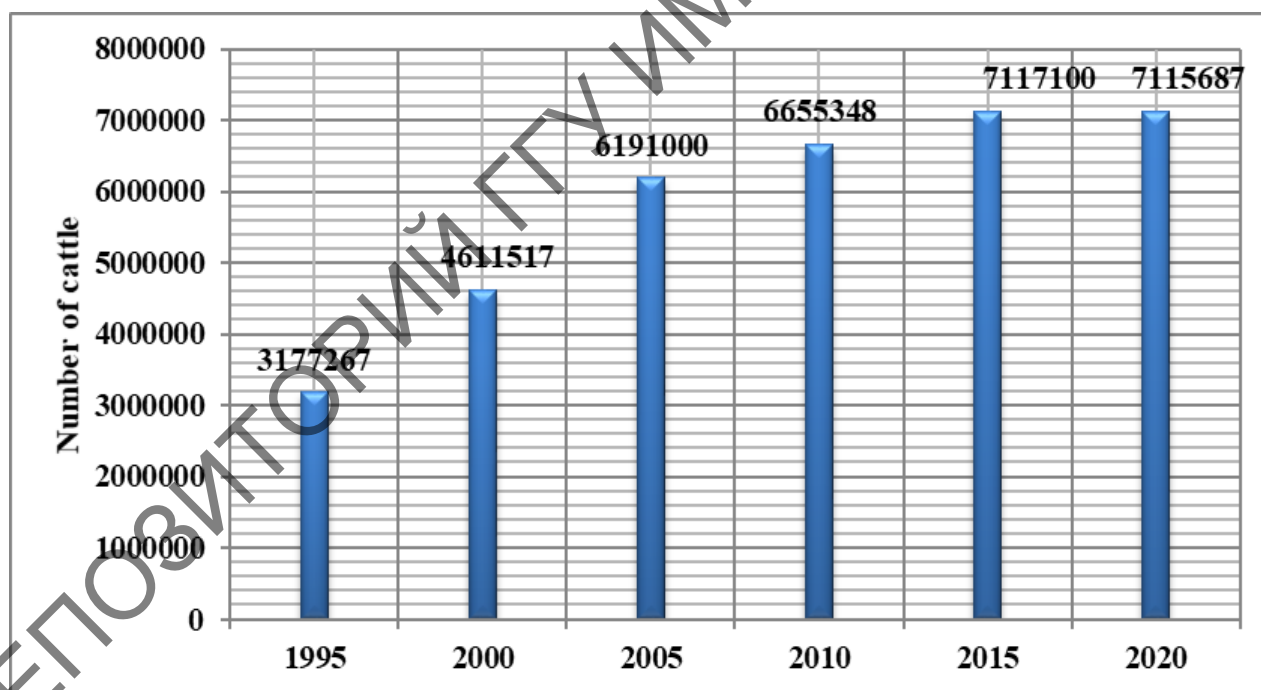


Figure 1 – Dynamics of the number of cattle in the Kura basin

Livestock grazing in the study area is carried out continuously in winter pastures, as well as in the surrounding pastures. Our analysis show that the total area of rural and pasture areas in the total area of the Kura Basin is 1146655 ha [5] 722432 hectares (63 %) of which are in the Kura-Araz lowland. As a result of unsystematic grazing in these areas, the soil and vegetation cover has been subjected to various degrees of degradation, resulting in desertification (Table 1).

Table 1 – Desertification of winter and suburban pastures in the Kura basin

Pastures common area (ha)	
1146655	
Rural pastures	Winter pastures
608335	538320
Total area of deserted pastures (ha/%)	
Rural pastures	Winter pastures
277407	224771
45,6	41,6
Total area (ha/%)	
502178	
43,8	

As seen from the table, 43.8 % of the pastures in the study area has been subjected to varying degrees of desertification. 45.6 % of the total deserted pastures is rural pastures and 41.6 % is winter pastures.

The area of winter pastures, grazing areas in the Kur-Araz lowland and the area of desertification according to the plains are given in the table below (Table 2).

Table 2 – Desertification of winter and suburban pastures in the Kur-Araz lowland

Pasture area on the plains (ha)									
Karabakh plain (ha)		Mil plain (ha)		Mugan-Salyan plain (ha)		Shirvan plain (ha)		South-Eastern Shirvan plain (ha)	
General area		General area		General area		General area		General area	
66410		171868		222786		154015		107353	
Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures
52418	13992	76357	95511	92012	130774	82798	71217	73840	33513
Total area of deserted pastures (ha)									
Karabakh plain (ha)		Mil plain (ha)		Mugan-Salyan plain (ha)		Shirvan plain (ha)		South-Eastern Shirvan plain (ha)	
Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures	Suburbs	Winter pastures
29400	9748	44274	45369	41693	68020	30020	34562	42282	19295
General area		General area		General area		General area		General area	
39148		89643		109713		64582		61577	

The variation of the area of deserted pastures depends on the number of livestock and the nature of grazing. In these areas, which have been subjected to desertification as a result of perennial and unsystematic grazing, the soil cover has been practically deprived of vegetation due to dusting, compaction and erosion.

As a result of unsystematic, excessive grazing of the Jeyranchol-Ajinohur, south-eastern foothills of the Lesser Caucasus and the foothills of the Ganja-Gazakh plain, numerous cattle trails have been formed on the slopes. Observations in the selected sample plots in the dry-steppe landscapes of these areas show that a plenty of trails of different directions, formed as a result of unsystematic grazing,

reaches of 15-70 cm in width and a of 3-10 cm in depth. The distance between them varies from 50 cm to 1-1.5 m in different areas of the slopes.

In the lowland winter pastures and grazing areas of the studied area, our observations in the selected sample plots show that the number of trails formed as a result of unsystematic grazing reaches a width of 20-80 cm and a depth of 5-10 cm. The distance between them varies from 50 cm to 2-2.5 m in different areas.

The depth of the trails and the distance between them have different dimensions on different surfaces and their parts, depending on the mechanical composition of the rocks, inclination of the slopes, the species composition of the vegetation, and the formation of the cover.

On the foothills, where the paths develop, erosion-denudation processes are more active than in the plains, and the washing of the soil layer and the destruction of vegetation are easier and more intensive. The soil layer remains on the slopes only in the form of small hills at the bottom of the bushes and deep-rooted plants due to accumulation. The slopes form ravines, creating rapid surface runoff during the rainy seasons or heavy rains. Rocky areas have developed in pastures where soil and vegetation have been subjected to degradation and erosion.

These changes in soil and vegetation cover with unsystematic grazing result in the formation of desert foci, and even after grazing is stopped, natural regeneration of plants is not possible. The presence of carbonate rocks and saline soils in grazing areas are the reasons of degradation of vegetation, surface erosion, and the spread of salt. In the study area, such areas are widespread in the pastures and winter pastures of the Jeyranchol lowlands, Bozdag, as well as Shirvan, South-Eastern Shirvan, Mil-Mugan, Salyan plains. This process is more intensive in areas where mineralized groundwater is close to the surface.

As the Caspian semi-desert landscapes of the Kura Basin consist mainly of sandy and clayey soils, the vegetation is characterized by very poor stability. All year round grazing has led to severe surface erosion and wind erosion. In these areas, dense ephemeral plants grow at the base of sharp shrubs, sometimes up to 1.5 meters in height. However, as these shrubs are destroyed for grazing, the plants' ability to regenerate is further depleted, creating the basis for the development of desertification centers.

Increased precipitation in spring and autumn in the study area creates a basis for the development of ephemerals. However, due to the fact that these periods coincide with the migration of animals, they are overloaded. During the summer months, the local livestock graze in these areas, so continuous grazing has a significant negative impact on the landscape, leading to the creation and development of desertification centers, reducing or completely losing the productivity of geocomplexes with poor resilience.

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ТЕКУЩЕЕ СОСТОЯНИЕ ОПУСТЫНИВАНИЯ ЗИМНИХ ПАСТБИЩ В БАССЕЙНЕ КУРЫ

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Установлено, что полупустынные и сухие степные ландшафты области подвержены перегрузке в зимние месяцы года, а сельские пастбища - в течение всего года из-за их низкой устойчивости. В результате этого процесса в полупустынных и сухих степных ландшафтах с низкими природными восстановительными свойствами, эрозией-денудацией, развитием процессов засоления, изменением видового состава растений, физической фрагментацией поверхности, уплотнением почвы, уменьшением биопродуктивности растительности проявляются очаги опустынивания.

Ключевые слова: ландшафт, животноводство, выпас скота, нагрузка, почвенно-растительный комплекс, опустынивание.

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БИОЛОГИЧЕСКАЯ ДЕТОКСИКАЦИЯ ФОСФОРНЫХ СОЕДИНЕНИЙ ГРИБАМИ АСПЕРГИЛЛАМИ

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На протяжении более 13 лет ведется работа по исследованию биodeградации элементного фосфора, а также фосфорсодержащих соединений. В перспективе они могут стать основой эффективных методов предотвращения и ликвидации загрязнений токсичными соединениями фосфора.

Ключевые слова: биodeградация, токсичные соединения фосфора, Aspergillus niger.

Биodeградация занимает почетное место среди методов обезвреживания токсичных загрязнений окружающей среды. При использовании биodeградации в окружающую среду не вносятся новые химические загрязнители, не используются жесткие физические факторы (температура, давление и прочее).

Включение нескольких токсичных ксенобиотиков (формальдегид, фенол и синильная кислота) (рисунок 1) в состав сахаров, жиров и протеиногенных аминокислот, является, пожалуй, наиболее показательным примером биodeградации. Это является весомым фундаментальным аргументом в пользу возможности биodeградации даже самых опасных веществ, таких, как объект нашего исследования элементный фосфор.