UDC 91(502) (575.2)

THE ROLE OF NATURAL CONDITIONS IN THE RESEARCH OF PASTURE LANDS (ON THE EXAMPLE OF THE REPUBLIC OF KARAKALPAKSTAN)

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Abstract. This thesis endeavors to elucidate the multifaceted role of natural conditions in the study of pasture lands. By thoroughly examining the intricate network of ecological interactions and human interventions, this study aims to shed light on the intricate relationships that influence the current and future courses of these crucial landscapes. Through the synthesis of theoretical frameworks and practical concepts, the primary objective of this study is to provide an academic examination of the key factors and influences that underlie the intricate dynamics of pasture land ecosystems. Additionally, it seeks to examine in-depth the significant impact of natural conditions on pasture lands.

Introduction. On Earth, pasture lands are crucial ecosystems that provide support for a variety of ecological functions and human activities. These extensive grasslands not only serve as crucial habitats for wildlife, but also play a paramount role in supporting global livestock production. Nevertheless, today, the intricate relationship between natural conditions and pastures continues to be a topic of profound scientific research and practical significance.

Understanding the dynamics of pasturelands necessitates a thorough investigation into the interplay between environmental factors and ecological processes. From soil composition and topography to climate and biodiversity, the natural conditions of a given region have a profound impact on the productivity, resilience, and sustainability of pastureland ecosystems.

Recognizing these complexities is of paramount importance in informing effective land management strategies amidst the growing environmental challenges and evolving socio-economic demands.

From this perspective, it is of utmost importance to thoroughly examine the natural conditions of these areas and derive the requisite conclusions in order to establish the optimal utilization of pasturelands. It is crucial to examine the accessible sources of soil and vegetation types, precipitation quantities, seasonally recorded air temperatures, and water availability levels in the pastureland regions.

Main part. If we consider the geographical positioning of the territory of the Republic of Karakalpakstan, we observe that this region is situated in the northwestern region of the Kyzylkum desert, the southeastern region of the Ustyurt plateau, the southern part of the Aral Sea, and the Amudarya delta. The northwestern region of the Kyzylkum area comprises expansive flat plains that gradually slope downwards, leading to the Aral Sea [4].

The territory of the Republic of Karakalpakstan is situated in a region characterized by a relatively straightforward surface topography. The western portion of Karakalpakstan comprises the Ustyurt plateau, while the remaining expanse is composed of the Turan plain.

The pasture lands within the territory of the Republic of Karakalpakstan predominantly comprise flat terrains and are subject to a rigorous continental climate marked by arid summers, relatively frigid winters, and minimal precipitation in the form of snow. According to the data, the average temperature in January is -4.9 ℃ in the southern region, -7.6 ℃ in the northern region. In July, the average temperature is 28.2 ℃ in the south and 26 ℃ in the north. The annual precipitation amounts to 110 mm, with the majority occurring during the winter and spring seasons. In this regard, the impact of drought in the

region is strongly evident, with evaporation rates being 9-10 times higher than average. The duration of the vegetation period spans from 194 to 214 days.

The irrigated lands in this region are located around the Amudarya basin. Existing literature has explicitly mentioned that due to extensive irrigation activities in the middle and upper reaches, the flow of river water towards the Aral Sea has been significantly diminished [3]. This situation leads to the expansion of desert areas and negative consequences of natural factors. It is important to highlight that, despite the vast land area of the Republic of Karakalpakstan, the potential for the expansion of irrigated agriculture remains relatively constrained.

The soil types observed in the Republic of Karakalpakstan vary according to the geographical regions in which they are situated. For example: "In the Amudarya delta, one can observe characteristic saline alluvial meadows, alluvial meadow groves, desiccated lakes, and marshes. The Kyzylkum region is renowned for its infertile soils. Within the Ustyurt plateau, gray-brown and infertile soils predominate. Sandy desert soils are scattered in the dry part of the Aral Sea" [4]. Depending on these types of soil, there are also different types of vegetation in the regions. This, in turn, serves to determine the types of livestock raised in the regions.

The productivity of the agricultural lands of the region is relatively low, and the average score is 42 points. The salinity of cultivated areas is high, with an average salinity of 35 percent. The high level of salinity leads to a decrease in the productivity of agricultural fields. Amudarya and Turtkul districts in the Republic of Karakalpakstan take the lead in terms of soil quality assessment with a score of 48 points. According to the data of the State Scientific Design Institute "Uzdavyerloyiha" on the assessment of soil fertility in the districts, it is presented as follows (Fig.1).

The main water source of Karakalpakstan is Amudarya. The largest lake of Karakalpakstan is the Aral Sea, as well as the Sudoche lake system connected with the Khujakul-Kara-Jar lake system, as well as artificial reservoirs created in the dry part of the Aral Sea.

Due to the fact that the territory of Karakalpakstan is located in the non-tropical desert zone, the vegetation cover varies by zone (Fig. 2).
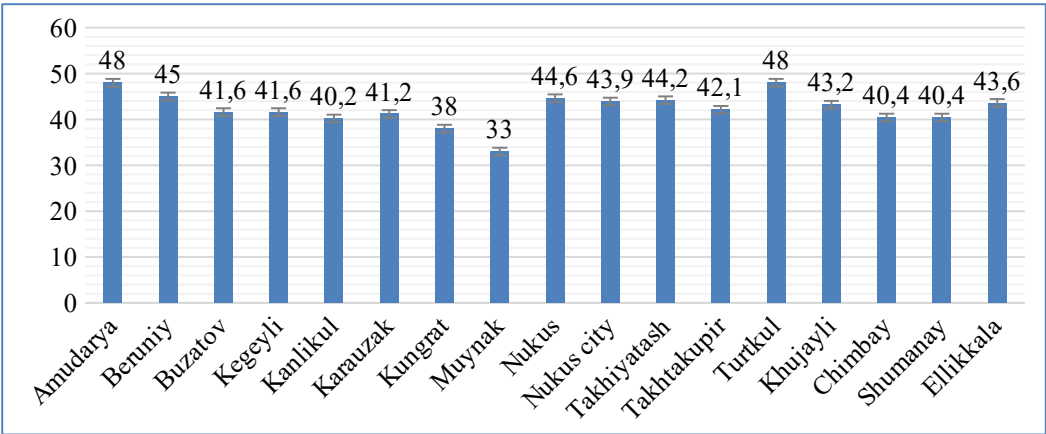

Figure 1. Average level of soil fertility (districts)
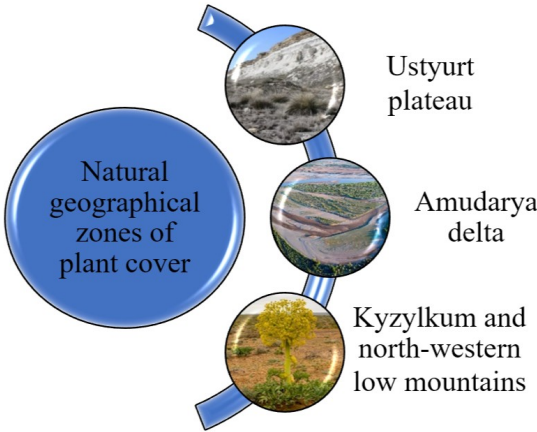

Figure 2. Natural geographical zones of plant cover

Today, a total of 979 types of plants are found in Karakalpakstan [4].

Currently, it is one of the natural plants of Karakalpakstan it is used as fodder, forest raw materials, medicines, and for the purpose of grazing livestock in pastures.

In the agro-economic system of the Republic of Karakalpakstan, the production of mainly cotton, rice, meat and wool products is relatively developed. The specialization of the region's agriculture in such areas is mainly related to its agro-climatic conditions [3]. The ratio of agricultural and livestock products varies from year to year depending on weather conditions.

Analyzes. Karakalpakstan has a large land area, but the level of utilization of this natural opportunity is low due to water scarcity. According to the data of the State Cadastre Chamber of the Cadastre Agency of the Republic of Uzbekistan as of January 1, 2022, only 34.2 percent of the total land area of the Republic of Karakalpakstan is used for agriculture. In turn, irrigated land is only 8.3% of the total agricultural land. At the district scale, there are more irrigated lands in Amudarya, Chimbay, Kungirat districts [6]. The least amount or share of them corresponds to Takhyatash, Muynak and Khujayli districts (Fig. 3).
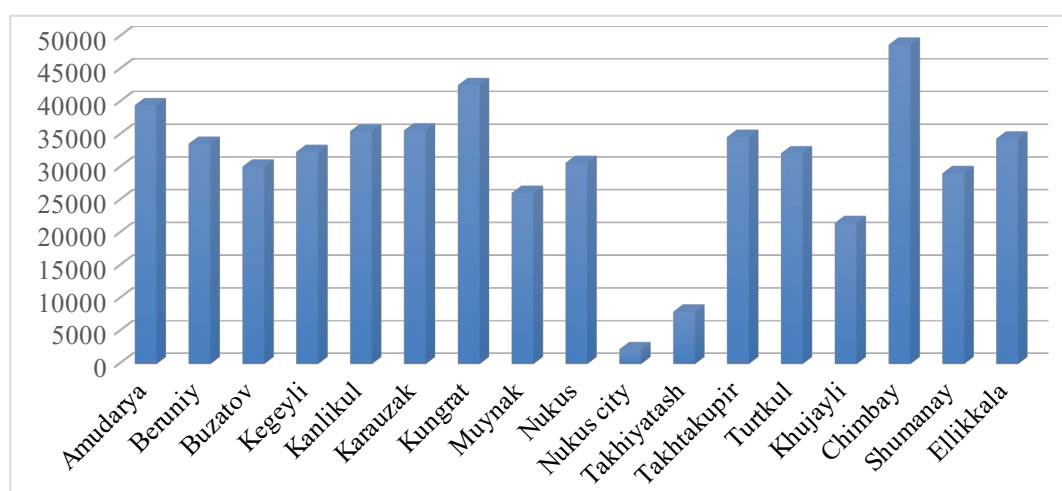

Figure 3. Irrigated land areas (in districts)

Beruniy, Turtkul, Amudarya, and Ellikkala districts are leading in terms of livestock breeding. According to the number of sheep and goats, Karauzak, Kungirat, Takhtakupir, Turtkul, Ellikkala districts stand out [3]. In Karakalpakstan, pasture cattle breeding is developed, mainly alfalfa is grown from fodder crops.
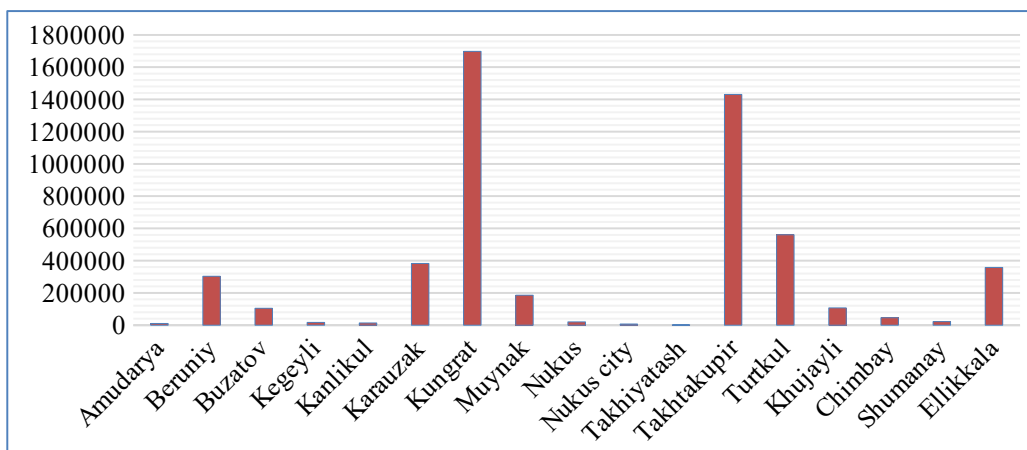
Figure 4. Total hay and pasture land of the Republic of Karakalpakstan (in hectares)

The land of pastures and hayfields is 5265.9 thousand hectares, of which 35.8 thousand hectares are irrigated pastures and hayfields [5].

With 15616 hectares of irrigated hayfields and pastures, the region with the largest area in the Republic of Karakalpakstan is Muynak district. Buzatov district, with an area of 14,638 hectares, takes the second place after Muynak district (Fig. 5).
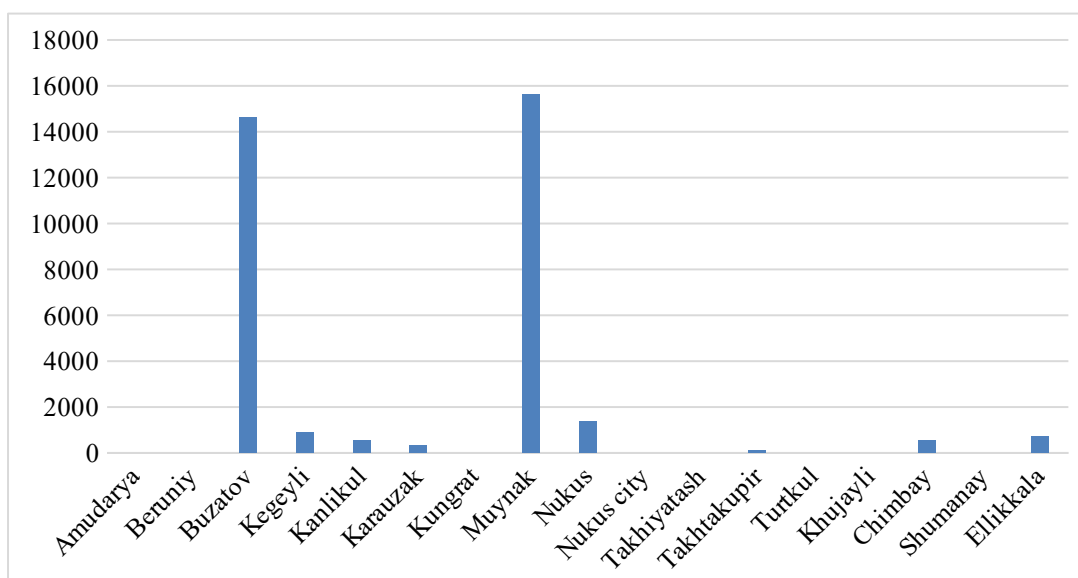

Figure 5. Total irrigated hay and pasture land in the Republic of Karakalpakstan (in hectares)

Considering the natural conditions of the Republic of Karakalpakstan, it is advisable to select livestock species in accordance with the principles governing soil and plant distribution.

Given that the majority of this region consists of desert areas, it is advisable to opt for livestock species that exhibit resistance to desert conditions and require minimal water consumption. Moreover, the selection of these species for breeding should be based on their capacity to efficiently utilize desert pastures.

Conclusions. Today, not only global climate change processes, but also negative effects of natural climate conditions are being observed in the region as a result of the drying up of the Aral Sea. This, in turn, can lead to an increase in pasture land degradation and a decrease in productive hayfields. This, in turn, naturally raises concerns about food security as the population continues to grow. From this point of view, it is necessary to constantly monitor these pasture lands, to know in advance the natural processes observed in the area and to implement the necessary measures while improving the use of modern technologies.

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