CLIMATIC FACTORS OF THE FORMATION OF THE RAVINE-BEAM SYSTEM OF THE LOWER VOLGA REGION

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Abstract. The Lower Volga regional natural complex has a heterogeneity of the relief, which, combined with the climate feature, leads to the degradation of soil covers. Disturbed soil cover with loose rocks is a fast mechanism for the formation of a gully-beam system. Natural natural conditions combined with human activity have led to catastrophic consequences of the withdrawal of land from land use. To prevent the development of these forms, it is necessary to conduct a study of each formation with tracking in a time period.

Keywords: ravine, soil degradation, stock water.

The planetary peculiarity of the relief is characterized by the constancy of the processes of internal and external forces of the Earth. In turn, the relief has a huge impact on all the shells of the planet and contributes to the life support of living organisms.

This article discusses the results of the study of the relief form of external factors of formation - the gully-beam system.

Relief formation is a process that occupies a large periodic time interval, during which macro-and micro-forms of relief are formed. The gully-beam system is confined to sedimentary formations, since light and loose rocks are quickly transported and moved under the influence of flowing waters and wind erosion [1,8,10,11, 14, 16-18].

The studied territory of the Lower Volga region is characterized by a hilly plain. The relief form has transitions from positive (Volga, Ergeninsky uplands) to negative values of height (Sarpinsk and Caspian lowlands) in relation to the level of the World Ocean.

The difference in the elevation of the relief with the existing sedimentary rocks forms a gully system under the influence of water and wind degradation of the soil. The characteristic of the weather parameters of the region is confined to a sharply continental climate, which is manifested in the unstable nature of the manifestation: thus, the lack of moisture supply is replaced by short rainstorms, which cause temporary watercourses. Meltwater and rainwater formed on elevated terrain areas due to height differences rush into the production line at high speed, eroding and moving loose rocks.

The processes of degradation entail the withdrawal of large land areas from the land use turnover, in connection with which there is a need for a comprehensive study of relief objects, which is an urgent priority task.
To take radical measures to restore degraded land, it is necessary to carefully and comprehensively study each object of the gully-beam system separately.

The object under study is located in a steppe semi-arid zone on the territory of the city of Volgograd. The place of the study is an urban settlement located in the Krasnoarmeysky district of Volgograd. The terrain is ravine-like. The studied ravine along the slope of the terrain crosses the street of 33 Heroes. The study of modern exogenous processes was carried out on the right right bank of the Volga River.

Description of the object under study.

At this site, a large landslide circus is visible with manifested degradation processes: landslides, collapsing and shedding of soil from the slope.

The landslide consists of two blocks:
- the upper block is overgrown with vegetation (wormwood, quinoa, cereals, grasshopper);
- the second block manifests itself at the average values of the height mark and stands out in the form of a large elongated landslide. In its manifestation, the sliding along the cracks of the slope is clearly visible. The cracks are large, vertical. Running water, getting into the cracks of the split, seeps and wets it. The water-saturated rock layer of loose formations under the influence of gravity begins to slide down the slope, dragging the overlying layers of rocks with it, which leads to a landslide.

The ravine is located to the east of the landslide circus, towards the residential area in the north-west direction from its top. Its length is more than 300 m.

The study revealed:
- the right bank is steeper than the left bank, the main reason is the mechanical composition of the soil, where lighter types of soils (such as sandy loams, sandstones, etc.) have a greater crumbling ability, i.e. they are able to form steeper banks. Therefore, it can be assumed that the right slope of the ravine is composed of light types of soils, and the left one is heavier.

The shape of the valley of the ravine is an indicator that depends entirely on the length of the bottom of the ravine. The long bottom is the trough-shaped shape of the valley, the short one is V-shaped. By studying the length of the bottom of the ravine, the strength of erosion activity is determined. In the V-shaped valley, the bottom has an incomplete formation, therefore, there is an

![Figure 1. Graph of deviations along the elevation marks of the right and left edges of the studied object, m](image-url)
intensive process of development of the ravine under the influence of erosion activity. The trough-shaped part of the valley is represented by a flat bottom, therefore, the erosion activity has a final period, i.e. the ravine is almost formed.

Soil parameters were studied on the natural cliffs of ravines. The color of the soil is light chestnut, the composition is sand and sandy loam. These soils have structureless characteristics and are able to easily erode.

The vegetation cover of the ravine bottom is represented by reeds.

![Figure 2. The object of the gully-beam system under study](image)

Test site (10x10 m). The microrelief is uneven, hummocky. Moisture is riding. The soil type is light chestnut, the mechanical composition is light sandy loam. According to humidity, they are fresh. A large surface of the soil is occupied by a grassy cover. This is a formed ravine, the bottom and slopes are gradually overgrown with vegetation, but there are erosive processes. By origin, this ravine can be attributed to natural ravines [1,11, 12, 13, 15].

During the research of the object of the gully-beam system, climatic indicators were analyzed according to the main parameters, such as: solar insolation, precipitation, temperature regime, wind activity. The effectiveness of the conducted studies formed the conclusion: climatic factors caused by the influence of solar insolation contribute to the formation of the object under study.

The runoff character of short summer precipitation has a destructive factor of the soil cover, as well as wind-drying dust storms.

Studies have confirmed that the climatic factors and the relief background of the territory of the Lower Volga region contribute to the development of soil degradation. Prevention of destruction and formation of erosive landforms is possible with the use of technological methods of reclamation directions [1,8,9, 10, 16,17].

The conducted studies were carried out by a group of researchers under the scientific guidance of the author, the results were tested in scientific events of various levels [1,2,5, 12].
The author and a team of scientists also conducted exploratory studies, where issues related to the reclamation of soil resources were considered (Sviridova L. L., 2018; Podkovyrov I. Yu., Glinushkin A. P., Sviridova L. L. 2020, 2021; Patent RU 2020622606, 2020), the results obtained can also be used in solving this problem [3, 4, 6, 7].

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