RELIEF AND LITHOLOGICAL AND GEOMORPHOLOGICAL STRUCTURE OF THE TERRITORY - AS FACTORS OF SOIL EROSION (ON THE EXAMPLE OF THE NORTH-EASTERN PART OF THE NAMANGAN REGION OF UZBEKISTAN)

Axmedov Burxoniddin Pasishiddinovich

Namangan Institute of Engineering and Technology, Docent

Abstract

The northeastern part of the Namangan region is one of the largest, ancient agricultural regions of the Fergana Valley. There are Namangan, Kasansay, Yangikurgan-Pishkaran and other oases. The region is bounded in the north and east with Kyrgyzstan; in the south - by the Naryn-Syrdarya river; in the west - by the Kasansay river. The total area of the territory is 1860 km², stretching from south to north - 75 km and from west to east - 50 km.

Keywords:foothills and outer chains, ridged-undulating slopes, composed of ancient Quaternary and Tertiary conglomerates, sandstones, covering with loess with eroded soils.

Introdution

The northeastern part of the Namangan region is one of the largest, ancient agricultural regions of the Fergana Valley. There are Namangan, Kasansay, Yangikurgan-Pishkaran and other oases. The region is bounded in the north and east with Kyrgyzstan; in the south - by the Naryn-Syrdarya River; in the west - by the Kasansay River. The total area of the territory is 1860 km², stretching from south to north - 75 km and from west to east - 50 km.

The main geographical elements of the territory can be called; valleys and terraces of the Naryn-Syrdarya River and basins of the lower reaches of small rivers flowing from the Chatkal ridge. The most significant of them; Kasansai, Padshaatasai and Chartaksai. In addition to these small rivers, the North Fergana and Bolshoi Namangan canals, as well as groundwater, play a significant role in the watering of the territory. The relief of the earth's surface is one of the conditions for soil formation and a factor that determines the development of erosion processes.

The geomorphological and lithological structure of the surface of the region under consideration can be characterized as follows.

Geomorphological, within the northeastern part of the Namangan region, there are two physical and geographical zones:

1. Plain zone. This includes the southern insignificant part of the region, that is, the right-bank floodplain and above-floodplain accumulative terraces of the Naryn-Syrdarya River, composed of alluvial-proluvial and layered alluvial deposits.

2. Foothill (hill, erosion-hazardous) zone. It consists mainly of a strip of hills (elevations with relatively gentle peaks) of foothills and outer chains, ridged-undulating slopes, composed of ancient Quaternary and Tertiary conglomerates, sandstones, covering with loess with eroded

soils. This zone also includes inter-hill and outer lowland slopes and transverse valleys of small rivers, which are fan cones composed of pebble overlain by clays and loams of varying thickness, terraces of ancient devoid of fine-earth cover and modern fan loops with a fine-earth cover and less eroded soils. The structural features of the region in connection with the geographical location, geological age, relief and nature of the constituent rocks make it possible to distinguish six geomorphological regions (Fig. 1) differing from each other not only in lithological and geomorphological diversity, but also in the heterogeneity of the soil cover and their susceptibility to erosion processes.

1. Adyrs of foothills (average altitude above sea level 800-1000m). They are ancient proluvial slopes, crumpled into folds and strongly eroded. Composed of ancient Quaternary and Tertiary conglomerates with a loess cover in the eastern part, the soil cover is highly eroded. It is subdivided into two subdistricts:

A). Adyrs of the foothills of the Chatkal ridge are located in the north of the region; they have a complex relief strongly dissected by ravines and hollows. Often, bedrocks, devoid of a fine-earth cover, emerge on the day surface, less often with an underdeveloped, highly stony soil;

b). The Bayastan ridge of adders, located in the north-west of the region, has an uneasy rugged relief, covered with a small thickness of loess.

2. The outer chain of hillside (400-800m), consists mainly of the Namangan and northeastern termination of the Sursan ridge of hillside, strongly dissected with narrow watersheds, often devoid of plateaus, short convex slopes, which are composed of ancient Quaternary conglomerates and pebbles in the northern part, mainly with a thick cover loess, in the south with loamy, loamy-cartilaginous and rubble covers. The soil cover is highly susceptible to erosion.

3. Upland-wavy piedmont slopes are ancient proluvial slopes with a general slope to the south with elevations of 1000m in the north and 650m in the south, composed of pebble-conglomerate deposits with a cover of loess. The waviness of the surface is due to a multitude of meredionally elongated softly delineated ridges of erosion origin. Here is the Yangikurgan-Pishkaran slope, which is a zone of ancient irrigation, geomorphologically similar to the previous zone and being its natural continuation in the east and north. The territory has the features of an adyr relief, somewhat leveled in the previous area.

4. Inter- hillside and outer flat slopes and transverse valleys of small rivers. They are pluvial fan fans, composed of pebbles and covered with clays and loams of different thickness, as well as terraces of ancient and modern fan fans, which are less powerful, sometimes devoid of fine earth cover. The soil cover is mainly slightly eroded and non-eroded. The inter-hillside flat slopes include: a) Nanai, b) Zarkent, c) Kukumbai and d) the eastern part of

Kasansai. Outside - e) Kyzyl-Yarskaya, f) Chartak-Namangan and g) the eastern part of Turakurgan.

5. Right-bank above-floodplain terraces of the Naryn-Syrdarya River are accumulative terraces of flat relief, composed of layered river deposits of different texture. The soils are not subject to erosion processes.

6. The floodplain of the Naryn-Syrdarya Rivers are the lands and islands of the floodplain terrace, which is under the direct influence of the river.



From the above, it can be seen that the surface of the region is characterized by a hilly, sharply dissected relief, which in turn contributes to the developed erosion processes. One of the main relief elements that directly affect the erosion processes is the steepness of the surface. Table 1 shows the data characterizing the region by the average slope of the surface.

Table 1 Distribution of the territory of the northeastern part of Namangan region by the nature of surface slopes

No	Average slope of the surface,	Square,	% of the total area
	in degrees	thousand	
1	до 1	50,3	27,0
2	1-2	41,2	22,2
3	2-4	39,5	21,2
4	4-7	19,6	10,5
5	7-10	28,2	15.2
6	10-15	5,2	2,8
7	more 15	2,0	1,1
	Total	186,0	100,0

A morphometric study of the relief (a schematic map of the average slopes of the surface, Fig. 2) shows that 73% of the area of the total surface of the region has an average slope of more than 10. The area of flat territories with a slope of less than 10 is 50280 hectares or 27% and is located mainly in the south of the region within the above-floodplain terrace of the Naryn and Syrdarya rivers, as well as on flat hillside' watersheds, making up small contours.

Territories with an average slope of 1-2 $^{\circ}$ (41250 ha or 22.2%), sometimes up to 4 $^{\circ}$, are mainly confined to ridge-wavy piedmont and external inter- hillside flat slopes, as well as in the valleys of Namanganssai, Chartaksai and other rivers, where erosion processes develop in a weak , less often moderate.

The average slope of the surface of the main part of the hillside of the outer chains (Namangan ridge and the northeastern part of the Sursan ridge) is from 4 to 10° (47790 ha or 25.7%). This area is characterized by a high erosion hazard, but despite this, it is here that the land is being developed for irrigation with the cultivation of row crops. Several new agricultural firms have already been created on such territories at the expense of newly developed lands.

Slopes with a steepness of 10-150, amounting to 5194 hectares or 2.8% of the total territory, are confined to the hills of the Chatkal ridge foothills, where the surface is highly indented and subject to a strong degree of erosion. Separate insignificant contours of such slope lands are found in other regions, especially in hillside, and are often developed for irrigation, intensifying the erosion processes. Steep slopes in the order of 15 ° and more make up 1.1% of the territory, such areas, due to the high steepness and skeletal structure of the surface, are not developed, but under the influence of natural and anthropogenic processes they are subject to a strong degree of erosion, often exposed, bare slopes.



It follows from the above that the region studied by us has a very complex lithological and geomorphological structure, which in many cases, together with other factors, creates favorable conditions for the development of erosion processes. And, the presence of significant slopes of the surface, especially on newly developed massifs, increasing the rate of irrigation water in the furrows, is the main reasons for the development of irrigation and gully erosion.

References

- Akhmedov B.P. Ways of increasing the fertility of irrigated eroded gray soils. Thesis. Tashkent. SoyuzNIHI. 1986 year
- Maksudov H. et al. Natural resources of Uzbekistan. Map "Soil erosion", M. 1: 500 000. Baku. 1991 year
- B. Akhmedov. Application of space information in mapping soil erosion in the desert zones of Uzbekistan. Collection of materials coordinates. a meeting. Ashgabat. 1987 year
- 4) Rakhmatullaev A., Akhmedov B. Ecological haritalarni tuzish tugrisida. Toshkent. Representative of ilmiy Conference materialari. OUMTV. 2003 year