GULLY EROSION AND THEIR DENSITY MAPPING

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Abstract:*Mapping gully erosion in complex landscape conditions in the worldIn erosion practice, linear forms of gully erosion are usually mapped byinterpretation of aerospace photographs (AFS-KFS), as well as traditional methodsmapping - using topographic maps. The article provides regularitiesmanifestations of growth and development of ravines of the Namangan adyrs studied linear forms of erosion withidentifying their morphological and morphometric characteristics.*

Key words:*Gully erosion interpretation, aerial photograph, aerial space photograph, photographic plans, topographic maps, scale, density, density.*

Mapping of gully erosion in complex landscape conditions is necessaryconsider [1].

As a result of studying the distribution of ravines in the Adyrs. We have compiledmaps of density and thickness of ravines on a scale of 1:10000. For characteristicsIndicators of density, density and frequency were used to cover the adyrsravines. We divide the Namangan adyrs into 6 gradations according to density [2, 3, 8].

I – Less than 0.1 km/m2
II – 0.11-0.30 km/m2
III – 0.30 – 1.0 km/m2
IV – 1.01 - 3.0 km/m2
V – 3.01 – 5.0 km/m2
VI – more than 5.01 0.1 km/m2

And also in 6 gradations of density

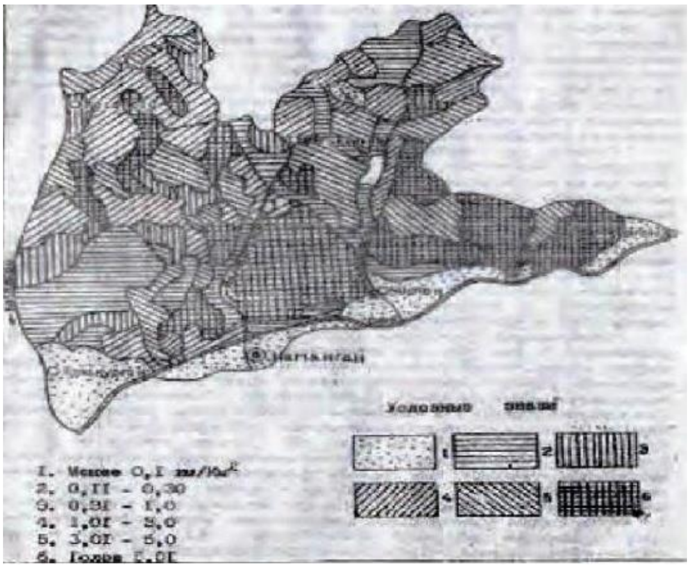
I – Less than 0.1 pcs. / sq. km; not ravaged.
II – 0.11-0.60 pcs. / sq. km; weakly ravaged.
III – 0.61 – 1.5 pcs. / sq. km; gully.
IV – 1.51 - 5.0 pcs. / sq. km; medium gully.
V – 5.01 – 10.0 pcs. / sq. km; heavily ravaged.
VI – more than 10.01 pcs. / sq. km; very heavily enchanted.

To develop measures to combat gully erosion, it is necessary to study the patternsmanifestations, growth and development of linear forms of erosion, identifying themmorphological and morphometric characteristics [4, 5, 9].

The morphology and morphometry of ravines on adyrs is closely related to the structure and dissected relief locally size, area drainage basin, lithology underlying rocks and types of economic use [6, 7, 10].

The morphometry of ravines on adjoining adyrs is directly proportional to depth local bases of erosion, degree of relief dissection and conduct irrigation structures. Of the 695 ravines surveyed, about 60% had average length no more than 25 m. According to the law of rectilinear motion concentrated runoff of temporary water flows on heavily ravaged lands the number of elongated ravines decreases to 9% over time.That's why the use of space photographs in deciphering linear forms of erosion on adyrah is not very effective, because resolution 1: 200,000 images is insignificant when deciphering short (less than 25 m in length) adyr ravines [8, 9, 11].

Density and thickness of ravines. To identify patterns in the distribution of ravines on the adyrs of the Namangan region we compiled maps of density and density ravines on a scale of 1:100000 (Fig. 1).



Such large-scale maps allowed us to take into account linear forms of erosion less 10 m. According to the density map of the entire northeastern part under study Namangan region maximum indicators (more than 10 units / sq. km.) occur on the irrigated lands of Chartak, Aikiran, Peshkaran, Uichinsky, Yangikurgon primum of repentant adyrs with lightly mixed gray soils on loess-like rocks. Here the density of the gully network reaches 63.1 PC. / sq. km., which is considered one of the highest indicators in the Middle region [10, 11, 12]. Such a high density of ravines, according to our recommendations (Nigmatov et al. 1994) do not allow the frequent use of methods of radical reclamation with preservation soil layer of the ravine areas [12, 13, 14].

In the ravine of the dangerous territories of the Adyrs, from organizational and economic measures into the practice of the agro-industrial complex, we introduced a complex of soil systems for conservation agriculture: bi-annual accounting and assessment of eroded lands on farms [14, 15].

In global erosion practice, linear forms of gully erosion are accepted map by interpreting aerospace photographs (AFS-KFS), and also traditional methods of mapping - using topographic maps. Analysis of various FSCs and their field interpretation showed that according to the images it is difficult to decipher small ravines and gullies (up to 300 m) at the initial stages of development, as well as in shaded and grassy areas of slopes, characteristic for mountain regions and adyrs. Only field survey and decoding made it possible to correct office data and obtain reliable information, which is very difficult. Impact mapping territory with ravines according to AFS scales 1:16000-1:47000 showed that at the same time it is not possible to obtain sufficiently detailed information on a regional scale, districts, which is explained by the following circumstances:

1) low (25-30%) availability of APS on the territory of Uzbekistan:

2) the absence of APS for the most dangerous ravines - populated and man-made disturbed areas, where the greatest activation can be expected erosion processes (settlements, reservoirs, quarries, etc.);

3) different periods of filming (5-10 years) and different scales (1:16,000 – 1:60,000), available APS for the same flight areas or types of terrain [9, 15, 16].

Availability of large-scale topographic maps for the entire territory of the republic allows you to assess land ravages using traditional methods. However it was necessary to clarify the possibilities of using these methods in the complex landscape-geomorphological conditions of Uzbekistan, since most traditional methods were developed for the flat territory of the European part of the former Union. Methods for continuous or selective determination of gully indicators for key areas based on sheets of large-scale topographic maps, cartographic definition of density fields, continuous or sampled determinations of the thickness and density of ravines in river catchment areas (Gully erosion, 1999) – All this is not very acceptable for mountainous areas. Indicators of gullying as a whole watershed, topographic sheet, any selected geometric figure (square, circle, rhombus, etc.) make a mistake, since this generalizes material on completely different types of relief, not to mention its shapes and elements [10, 17].

The proposed methodology for compiling gully maps takes into account all the features distribution of ravines in complex landscape and geomorphological conditions. When analyzing gullying, the basis of a territorial unit is the type of relief terrain, in which both the altitudinal zonation and the morphology of the primary relief on which ravines develop. If previously, according to the method developed for flat territories, it was necessary to take a sheet of topographic map, divide it into a network of squares or river catchments and determine gully characteristics from them, then now, according to the proposed method, you should first highlight on this topographic sheet (M. 1:10.000 or 1:25.000) types of relief, and then based on them determine the number of ravines, length, density of the gully network, contour area with by dividing the quantity by the area to calculate the density ravines, that is, dividing the length of the gully network by the area - the density of the gully network. This, of course, complicates the work somewhat, especially if there is no ready-made maps of landscape-geomorphological zoning, but it allows obtain more accurate data differentiated by types of relief and landscapes for subsequent zoning against gully activities. Data clarification topographic maps are produced for key areas for each type of relief based on AFS materials at scale 1:16,000 – 1:30,000 for mountain and smaller scales (1:25,000 – 1:60,000) – for the desert zone. Key site data make it possible to calculate the correction factor for selected areas strictly according to types of relief [10, 11].

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