

PRINCIPLES OF INDOOR LAND MANAGEMENT

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Abstract: Widespread anthropogenic land development in Uzbekistan in 1975-1980. It influenced the intensification of the processes of erosion and man-made soil disturbance, which led to a reduction of more than 300 thousand hectares of agricultural land and a deterioration in the soil and ecological situation of the country. The problem is aggravated by the fact that in the arid zone and the mountainous region of the Republic, the use of traditional methods of land reclamation and reclamation of soils disturbed by ravines and anthropogenic human activity. [1, p. 4].

Scientific justification determining the effectiveness of anti-theft measures should take into account all aspects of economic activity - economic, environmental and social.

Keywords: Efficiency, cost, payback, economic, costs, development, land reclamation, measures, anti-erosion, enclosed, relief, land surface.

Ravine dangerous places are of great importance, the relief of which we call a set of irregularities of the earth's surface, which is especially characteristic of the development of ravine formations. Depending on the nature of the terrain, the terrain is divided into flat, hilly and mountainous. [2, p. 92].

Soil conservation agriculture and afforestation. New subtypes of man-made soils are formed on the planned surface of the infected area, represented by outcrops and embankments. The exposed area is characterized by dense build and low filtration capacity. The bulk surface is characterized by subsidence and potential suffusion hazard, loose profile and significant water permeability. Therefore, one of the alternative methods of agricultural use of enclosed lands is the indigenous reclamation of ravines. It provides for a set of reclamation techniques for the reconstruction of eroded lands in order to create a cultural background on them. [3, p. 7].

In general, the entire planned surface of the substrate soil has low fertility and minimal erosion resistance. Therefore, in the development of ravines for agricultural use, it becomes necessary to solve these inseparable tasks: preventing the manifestation of erosion processes and intensively increasing the fertility of planned lands.

Soil conservation farming on the reclaimed surface area should be comprehensive, combining agro-forestry and hydro-reclamation techniques to protect soils from erosion. [4, p. 236].

This method of ravine development is acceptable for a zone of loess deposits, since the rocks are characterized by relatively high potential fertility in terms of agronomic properties.

Since ravines, especially "Mountainous" ones, can have different forms of relief in terms of genesis, morphology, and time of formation (from ancient to modern). [5, p. 95].

The development of ravines in dangerous places in the initial stages largely depends on the armor role of vegetation, which is determined by the amount of ground mass and roots.

These indicators in natural landscapes are determined by the biological type of vegetation, and for cultivated ones by the agrophone. But the soil-protective role of plants in conditions of natural moisture cannot be established regardless of taking into account the periods of vegetation development and the occurrence of erosive and dangerous precipitation. In our case, the soil protection capacity is calculated by dividing the projective coating by the maximum 20-minute erosion index of precipitation [6, p. 92].

The development of ravines and the creation of a cultural background on them requires a scientifically based approach to the technological stages (A-B) of soil conservation agriculture. To develop backfilling and planning of enclosed lands in indigenous land reclamation, it is necessary to study the patterns of manifestation, growth and development of linear forms of erosion to identify their morphological and morphometric characteristics.

Calculation of the amount of excavation work. The amount of excavation is directly proportional to the parameter (morphometry) of the ravine to the intended slope of the slopes being excavated. To determine the parameters of the ravine, data on length, width and depth are collected. Its length is determined by measuring the bottom using a measuring tape. The average width ($V_{s.r.}$) is calculated as the half-sum of the width of the ravine at the top and the width of the bottom. The depth of ravines (H) in the initial stages of development can be determined by measuring the height of the cliff, and subsequently - the length (l), the steepness of the slopes (tga) according to the formula [7, p. 93].

$$H = l \cdot tg \alpha_m (1)$$

The width and depth of the gullies vary in profile. Therefore, measurements should be carried out in places where there is a clear difference between these indicators or through conventionally accepted equal segments 10,20,30..... n , m. The fewer the segments, the more accurate the calculations of their parameters will be. Then the weighted average value of the depth and width of the ravine is calculated according to formula (2) [8, p. 4].

$$H_{cp.B3.B.} = \frac{H_1 + H_2 + H_3 + \dots + H_n}{n} \quad (2)$$

$$H_{cp.B3.B.} = \frac{B_1 + B_2 + B_3 + \dots + B_n}{n}$$

where n is the number of measurement points. Using formula (2), the total volume of soil removed from the ravine is calculated (V):

$$V = 0,5 \cdot B_{cp.B3.B.} \cdot H_{cp.B3.B.} \cdot l (3)$$

In the case when the ravine is completely filled in, the required volume of soil to fill it will be equal to the volume of material removed during its formation. [9, p. 17].

If partial irrigation of the ravine slopes is carried out, then the volume of the soil being cut will always be less than the volume of the removed one. With partial flattening, it is necessary to clarify the optimal projected slope of the reclaimed surface. The choice of the design slope depends on a number of factors: the properties of the soil, the underlying rock, the size of the ravine, the methods of development and agricultural purposes. [10, p. 17].

For the territory of irrigated agriculture in Uzbekistan, when determining the projected slope, the following criteria must be followed:

1. If the degree of fragmentation of the territory by ravines does not exceed 0.7 km /km², and it cuts through arable land with a slope of no more than 5 °, as well as the boundary of the accumulation of easily soluble salts lies at a depth of more than 5 m, and it is intended for sowing row crops, then the slope should be less than 5 °.[11].
2. If the surrounding areas have prevailing slopes of more than 3° and in the future it is planned to use them for orchards and vineyards, then the design slope of the slope may exceed 50. [12].
3. If the depth of the mass accumulation of easily soluble salts is deeper than 5 m from the surface, then the design slope is steeper (up to 10 °) with the sowing of perennial grasses and

legumes, and the laying of tree plantations is carried out on micro- and macroterraces (steepness of more than 15°).

4. If the ravine is filled in with imported soil, then for extensive mechanization of field work it must have a steepness corresponding to the slope of the surrounding area.

Development projects can be drawn up for individual ravines or for their systems covering no more than 5-7 hectares. For each site (development block), reclamation techniques of soil conservation agriculture are separately planned [13].

For example, to fill a ravine with a total length of 105 m, a weighted average depth of 4.5 m and a width of 3.4 m, it is necessary to demolish the soil in a volume of 1600 m³. If the slope of the surrounding area is $1.8-2.0^\circ$, and its area is 1.8 hectares, then the projected slope of the filled-in area will not exceed 5° . This means that this reclaimed surface can be developed for narrow-scale crops. [14].

Filling and planning of ravines. In the process of complete or partial filling of ravines, the soil profile is transformed, new man-made soils are formed on the planned surface. [15].

Technogenic soils of the loess zone will mainly have a low degree of salinity, dusty fractions will prevail in the granulometric composition, the content of humus and water-resistant aggregates decreases by 2-3 times and, accordingly, will be characterized by low erosion resistance [16].

Therefore, before starting work on filling gullies, it is necessary to selectively remove and store the fertile layer of demolished soils. This can be done in the following cases:

1. If the main soil is not eroded or slightly susceptible to erosion. The humus content in the arable horizon exceeds 1%.
2. If the number of ravine peaks does not exceed 3-4 units/ha, and their occupied area is less than 20% of the territory of the enclosed area.
3. If the slope of the fence is not more than 10° and allows free movement of the mechanisms.

If the conditions do not correspond to at least one of these indicators, then it is impractical to carry out land management. The depth of the surface layer of the demolished soil of the graft depends on the thickness of the humus horizon, in light gray soils it is usually 10-15, typical gray soils 17-20, dark gray soils 20-25, meadow soils 25-30 cm, slightly alluvial differences 20-35 cm and strongly alluvial more than 35 cm. Therefore, before carrying out land reclamation work, a detailed soil survey of the surrounding areas is required in order to establish the graft capacity [17].

The cutting of the fertile layer of the surrounding soils and its storage at a distance of up to 50 m must be carried out with bulldozers, and more than 50 m with a scraper. Then the ravine is filled with exposed soil up to the projected slope and the surface is carefully planned, after mechanical tamping, the stored humus layer of soil is evenly applied to the planned surface.

In the infected areas of the Republic, the soil cover is mainly (more than 80%) represented by medium- and heavily washed soils. Therefore, removal, transportation and application of a fertile soil layer to planned ravine lands can be carried out from other sites. In this case, the graft (applied layer) must have favorable physical and chemical properties along with the increased content of the organic part of the soil. For example, in land management, where the base consists of clay rocks, soils of a lighter mechanical composition are recommended as a graft, and to achieve greater cohesion of sandy soils, it is advisable to use heavy soils. The best quality graft can be washed varieties of soils or floodplain soils [18].

The best terms for the development of ravines by filling in for the conditions of Uzbekistan are October - November. During this period of the year, the fields are cleared of crops, the surface is naturally moistened and the entire area is evenly compacted.

Namangan Adyri location in the northeastern part of Namangan region as is known, the main criterion for combating gully erosion is the one-time implementation of anti-gully measures throughout the runoff formed by the surface, that is, completeness in the implementation of organizational and economic, forest – Agro-hydro reclamation measures [19].

Patterns of growth and development of the Namangan Adyr ravines to study the patterns of linear forms of erosion with the identification of their morphological and morphometric characteristics.

The calculation of economic efficiency against gully measures is carried out in order to select the most appropriate and quickly recoupable facilities, while the payback period of capital investments can serve as the main indicator. It is determined by dividing all costs associated with the implementation of anti-theft measures by the additional net income earned at their expense.

When calculating the payback period for anti-erosion reclamation measures, it is recommended to take into account the following requirements:

a) calculation of the effectiveness of anti-gully measures on mountain pastures (E) according to the formula: $E = S - Z + T$

where C is the cost of an additional crop per feed unit produced through land reclamation and drainage measures; 3 is the cost of purchasing an equivalent amount of feed for livestock; T is the cost of transporting feed;

b) when determining the effectiveness of a whole complex of anti-ravine measures, the calculation is not the total effectiveness of all individual land reclamation techniques, but their average indicator for the complex;

c) add to the net income the alienated amount for the treatment of water management facilities from siltation and pollution of an equivalent volume of protected material (substance) by anti-drainage measures;

d) during the development of ravines, add to the amount of additional net income of the reclaimed area the net income generated by the increased productivity of irrigation soils and forest plantations, and they will not be part of the reclaimed land.

Ravine-reclamation zoning

Thus, in fenced and ravine-hazardous territories, the farming system should be soil-protective, and the land reclamation system should provide for a complex of anti-ravine measures differentiated by region. Therefore, a scientifically based selection of anti-erosion measures for each of the areas of ravine erosion is of great economic importance. The above implies the need to develop a gully-reclamation zoning of the territory on the scale of districts, regions and, of course, the Republic.

The following main components should be used as the basis for ravine-reclamation zoning: 1) maps of land contamination and ravine danger; 2) zoning of the territory by type of relief; 3) zoning of the territory by type of agricultural use; 4) complexes and types of reclamation anti-erosion measures. Thus, each area will be characterized by a special type of manifestation of gully erosion, relief, agricultural use and a set of reclamation measures against gully throughout the catchment area. A transcript of the materials of the ravine-reclamation zoning of the territory of Uzbekistan can be obtained by application from the Institute of Soil Science and Agrochemistry of the Academy of Sciences of the Republic of Uzbekistan.

List of used literature:

1. Dadakhodjaev A., Mamazhanov M. M., Khaidarov Sh. E. Assessment of gully-hazardous territories of Namangan adyrs // Wschodnioeuropejskie Czasopismo Naukowe (East European scientific journal) Agricultural science. - 2019. - Vol. 5. - P. 45.
2. Dadakhodjaev A., Mamadjonov M. M., Khaidarov Sh. E. Typification of relief for assessing gully-hazardous territory of Uzbekistan // Science Time. - 2018. - No. 4 (52). - P. 92-94.
3. Shukurillaeich M. A. et al. Checking the bearing capacity of bending reinforced concrete products along an inclined section // Science Time. - 2018. - No. 6 (54). - P. 42-44.
4. Dadakhodjaev A. et al. Soil and water conservation agriculture and afforestation of gully areas of Namangan Adyrs // Young scientist. - 2017. - No. 24. - P. 236-238.

5. Dadakhodjaev A., Mamadjonov M. M., Khaidarov Sh. E. Assessment of the area affected by gully erosion and the growth rate of ravines of Namangan Adyrs // Science time. - 2018. - No. 4 (52). - P. 95-99.
6. Dadakhodjaev A., Mamadjonov M. M., Khaidarov Sh. E. Relief typing for assessing the gully hazard of the territory of Uzbekistan // Science Time. - 2018. - No. 4 (52). - P. 92-94.
7. Razzakov S. Zh., Kayumov D. A. COMPOSITION OF RAW MATERIALS IN CERAMIC CLAY PRODUCTION PROCESS AND INCREASING CLAY STRENGTH: COMPOSITION OF RAW MATERIALS IN CERAMIC CLAY PRODUCTION PROCESS AND INCREASING CLAY STRENGTH. – 2023.
8. Razzakov S. J. et al. The importance of soil and water for increasing the strength of ceramic products //IOP Conference Series: Earth and Environmental Science. – IOP Publishing, 2023. – T. 1231. – No. 1. – S. 012080.
9. Anvarjon D. et al. Principles of indigenous reclamation of the contaminated lands of the ferghana valley (for examples of namangan adyrs) //Ethiopian International Journal of Multidisciplinary Research. – 2024. – T. 11. – No. 12. - pp. 601-604.
10. Dilshad Abdugafur Og Q. et al. NATURE IN THE INTERIOR //IQRO INDEXING. – 2024. – T. 7. – No. 2.
11. Anvarzhon D., Abdukhalikovich H.M. Juraev Ulugbek Inomiddin ugli //Gully erosion and their density mapping. INTELLECTUAL EDUCATION TECHNOLOGICAL SOLUTIONS AND INNOVATIVE DIGITAL TOOLS. International-scientific-online conference. Part22 December 3rd AMSTERDAM. - 2023. - P. 104-108.
12. Anvarzhon D. et al. PRINCIPLES OF IMAGE EROSION MANAGEMENT OF NAMANGAN ADYRS OF UZBEKISTAN //Proceedings of Scientific Conference on Multidisciplinary Studies. – 2023. – T. 2. – No. 12. – pp. 121-125.
13. Razzakov S. Zh., Kayumov D. A. RAW MATERIAL COMPOSITION AND INCREASING THE COMPOSITION OF Development of ravaged land plots, taking into account soil and water conservation agriculture (Namangan adyrs) //Journal of new century innovations. – 2023. – T. 38. – No. 2. - pp. 109-112.
16. Evaluation of the dangerous terrain of the Namangan hills of the Fergana Valley. uma Jorayev is the son of Ulugbek Inomiddin. IQRO 2 (8), 99-103, 2024. 2024.
17. Anvarzhon D., Ulugbek J. Development of ravine lands taking into account soil protection agriculture of the chartak adyrs //Proceedings of International Conference on Scientific Research in Natural and Social Sciences. – 2023. – T. 2. – No. 12. - pp. 193-197.
18. Jorayev Ulugbek Inomiddin ugli Melibaev Makhmudzhon, Dadahodzhaev Anvar. Indicators Of Average Life Of Tractor Pneumatic Tires Under Cotton Processing Conditions. Journal of Advanced Zoology. Volume 44 IssueS-07 Year 2023 Page 1027:1032
19. Hudaykulov S. et al. Modeling favorable conditions in the downstream of a dam under seismic effects //BIO Web of Conferences. – EDP Sciences, 2024. – T. 145. – P. 03039.