PRINCIPLES OF INDIGENOUS RECLAMATION OF THE CONTAMINATED LANDS OF THE FERGHANA VALLEY (FOR EXAMPLES OF NAMANGAN ADYRS)

Dadakhodjaev Anvarjon

c.a.s. Associate Professor (NamECI)

Mamajonov Marufjon

Senior Lecturer

Juraev Ulugbek Inomiddin ugli

Kayumov Dilshod Abdugofur ugli

Lecturers, Namangan Institute of Civil Engineering (NamECI), Namangan, Uzbekistan

Abstract: The root reclamation of the contaminated lands. A set of agroless, reclamation, and hydro-reclamation measures for the indigenous reclamation of the contaminated lands of Dolyn were studied.

Keywords: Adyr, soil conservation, anti-gully, event, agroforestry, economic, hydro-reclamation measures.

The use of reclamation anti-theft techniques in the medium and heavily ravined territories of the Namangan Adyras is ineffective due to their erosive fragmentation. Therefore, one of the non-alternative methods of agricultural use of contaminated lands is the root 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. [1]

As well as the reclamation of contaminated lands, soil conservation agriculture on the area of the reclaimed surface should be comprehensive, combining agro-forestry and hydro-reclamation techniques to protect soils from erosion. [2]

According to the law of rectilinear motion of concentrated runoff of temporary water flows on heavily polluted lands, the number of elongated ravines decreases to 9% with the expiration of time. [3]

In the ravine of the dangerous territories of Namangan Adyrs, we have introduced a complex of soil systems of conservation agriculture from organizational and economic measures into the practice of the agro–industrial complex. [4]

The development of ravines and the creation of a cultural background on them require a scientifically based approach to the technological stages of soil and water conservation agriculture. [5]

We know that gully erosion is the erosion of soils and underlying rocks by temporary water flows in the modern upper anthropogenic period. As a result of this process, the formation of linear forms of erosion of the ravine occurs at various stages of its development. [6]

To study the development and indigenous reclamation of contaminated lands. An important criterion for assessing gully erosion is the definition of the territory according to the categories of ravine danger of land, which should be the basis for the design of anti-erosion measures. Ravine danger of lands is an area where a combination of natural conditions creates a danger of the development of gully erosion during economic use. [7]

Table 1. Grouping of ravines according to the degree of damage to the territory

Category of ravine hazard Natural factors determining ravine hazard	I. There is no danger	II. Weak	III. Average	IV. Strong	V. catastrophic
1. Erosion index of liquid precipitation	less than 1.0	1.1-2.0	2.1-4.0	4.1-6.0	more than 6.0
2. Soil erodibility, t/ha	less than 2.0	2.1-3.0	3.1-5.0	5.1-10.0	more than 10.0
3. Rock pressure, m/s	more than 3.5	1.76-3.50	0.76-1.75	0.40-0.75	more than 0.40
4. Depth of local erosion base, m	less than 5	5.1-10.0	10.0-50.0	50.1-100.0	more than 100.0
5. Slope shape	horizontally flat	concave	Complex	Straight	Convex
6. Soil-protective capacity of plants	More than 60	31-60	21-30	11-20	Less than 11

And also to draw up gully-reclamation zoning the following main components should be based: 1) maps of gully and gully hazard of lands; 2) zoning of the territory by types of relief; 3) zoning of the territory by types of agricultural use; 4) complexes and types of reclamation anti-erosion measures. [8]

In general, the entire planned surface soil-substrate has low fertility and minimal erosion resistance. Therefore, in the development of ravines for agricultural use, there is a need to solve these inseparable problems: preventing the manifestation of erosion processes and intensively increasing the fertility of planned lands. [9]

Soil-water conservation agriculture on the area of the reclaimed surface should be comprehensive, combining agro-forestry and hydro-amelioration methods of protecting soils from erosion.

To develop methods for the radical reclamation of gully-covered lands on the adyrs, a key site was selected on the territory of the Karachukki farm in the Chartak massif.

The typicality of the key area was determined by: high density of the gully network, the area of mass agricultural development of ravines for agricultural production, the diversity of the underlying loess-like loams with layers of crushed stone and sand, as well as their salinity. The tasks in the radical melioration of ravines were the characteristics of the soils and underlying rocks of the gully-covered lands, the calculation of earthworks, the choice of a system of agro-hydromelioration methods of development, the study of erosion processes on the planned surface and the development of scientifically sound methods for increasing the productivity of technogenic soils. Characteristics of the gully calculation of the adyrs of Karachukki "Chartak Massif" of the tables below1. [10]

Table 1.

№	Density pcs/sq. km	Density sq/km	Frequency, m	Area, thousand hectares
1.	0.61-1.5	0.31-1.0	500-201	0,9
2.	1.51-5.0	1.01-3.0	200-101	1.5
3.	5.01-10.0	3.01-5.0	100-51	3.3
4.	More than 10.01	More than 5.01	Less than 51	1.1

Large-scale soil-geomorphological survey showed the possibility of transplanting gully soils and choosing a method for filling and leveling ravines with local soil. Since the degree of erosion dissection of the key area did not exceed 0.7 sq/km, the prevailing steepness was 5-7 degrees. The volume of excavation work was equal to 1864.8 cubic meters. Due to the close occurrence of gypsum and saline layer of underlying rocks and the impossibility of filling ravines with imported soil, it was necessary to preserve the soil horizon with less than 1 percent humus content. [11]

In the process of filling and planning of ravines on the reclaimed surface, technogenic soils were formed, which consisted of bare and filled soils. They generally reflected the features of the parent loess-like loams, which are characterized by high dustiness (the content of fractions of 0.05 - 0.01 mm from 59 to 65%), light mechanical composition (the content of physical clay is 21-32%). Unlike the gully soils, (Fig. 1) technogenic soils had less compaction (1.1-1.3 g / cm. cube) and, accordingly, greater filtration capacity of the filled area. Based on the permeability of the soil of these areas, the accepted options upon completion of the study are the wetting contour of typical sierozems on dry lands and technogenic soils on gully lands (A-B-strongly washed out typical sierozems B-technogenic disturbed soils) Fig. 2.

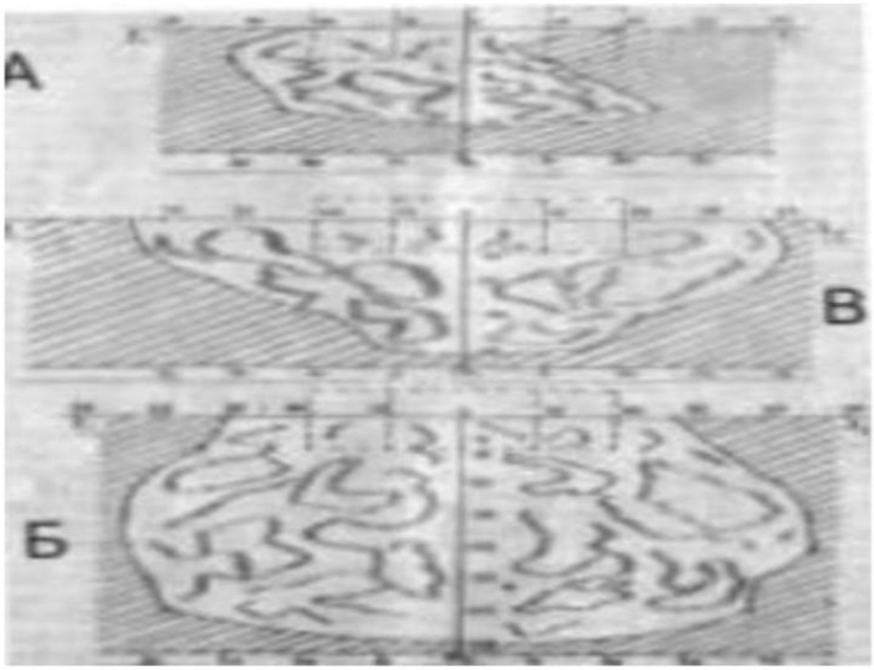

Fig. Wetting contour of typical sierozems and technogenic soils on gully-covered lands

(A-B – heavily washed-out typical sierozems,

B-technogenic – disturbed soils)

The high filtration coefficient (1.42) and the presence of easily washed-out salts (0.460-0.528% of dry residue) created favorable conditions for the development of suffusion funnels. The leveled flat surface (no more than 5-7 degrees) made it possible to carry out agro-reclamation work without creating special sites and terraces. But the low humus content in the technogenic soil (0.3-0.6%), the poor provision of the upper root-inhabited horizons with forms of nitrogen, potassium and phosphorus available to plants dictated the need [12]

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