

**DEVELOPMENT OF RAVAGED LAND PLOTS, TAKING INTO ACCOUNT  
SOIL AND WATER CONSERVATION AGRICULTURE  
(NAMANGAN ADYRS)**

*Dadakhodzhaev Anvarzhon;*

*Candidate of Agricultural Sciences, Associate Professor.*

*Xamrakulov Mansurjon Abdukhalikovich; senior teacher*

*Juraev Ulugbek Inomiddin ugli; teacher*

*Namangan Civil Engineering Institute (Nam ISI).*

*Republic of Uzbekistan, Namangan.*

**Annotation:** Development of ravaged land plots, taking into account the soil and water conservation agriculture of the Namangan adyrs, new subtypes of technogenic soils, represented by outcrops and embankments, are formed on the planned surface of ravine land plots. The exposed area is characterized by a dense structure and low filtration capacity. The bulk surface is characterized by subsidence and potential suffusion hazard, friability of the profile and significant water permeability.

**Keywords:** Namangan adyrs, conservation agriculture, gully areas, afforestation, water permeability, filtration, water protection, sustainability, plowing, fertilizers, water-resistant, erosion resistance, runoff, water-resistant area, erosion, assessment, criteria, categories.

Namangan Adyrs are located in the northeastern parts of the Namangan region. [1, p. 16]. The problem is aggravated by the fact that in the arid zone and mountainous region of the republic the use of traditional methods of reclamation and reclamation of soils disturbed by ravines and man-made human activity. [2, p. 95].

Widespread anthropogenic land development in Uzbekistan 1975-2000 influenced the intensification of processes of erosion and technogenic soil disturbance, which led to a reduction of more than 375 thousand hectares of agricultural land and a deterioration in the soil-ecological situation of the country.

An important criterion for assessing gully erosion is the definition of the territory according to the categories of gully land hazard, which should form the basis for the design of anti-erosion measures. Ravine danger of land is an area where a combination of natural conditions creates a danger of developing gully erosion during economic use. [3, p. 4]

Soil and water conservation agriculture on the area of the reclaimed surface should be a comprehensive combination of agro-forestry and hydro-reclamation methods for protecting soils from erosion.

Soil conservation agriculture and afforestation. On the leveled surface of the ravine area, new subtypes of technogenic soils are formed, represented by outcrops and embankments. The exposed area is characterized by a dense structure and low filtration capacity. The bulk surface is characterized by task-specific nature and potential suffusion hazard, friability of the profile and significant water permeability.

Therefore, one of the non-alternative methods of agricultural use of ravine lands is radical 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 [4, p. 7].

In general, the entire leveled soil-substrate surface 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 [5, p. 236].

Soil and water conservation agriculture on the area of the reclaimed surface should be comprehensive, combining agro-forests and hydro-reclamation methods for protecting soils from erosion. According to the law of rectilinear movement of concentrated runoff of temporary water flows on heavily gully lands, the number of elongated ravines decreases to 9% over time [6, p. 5].

In the first year of development, double or triple doses of organic fertilizers are applied for fall plowing against the backdrop of mineral fertilizers, at the rate adopted on the farm for the crop being sown. The following are used in the form of organic components: semi-rotted manure (40–60 t/ha), hydrolyzed lignin (30–60 t/ha), recycled municipal waste (30–50 t/ha) or wastewater (60–90 t/ha). Moreover, in the land plot, lower norms of organic components are applied, and the depth of their plowing should not exceed 15 cm in order to preserve the graft layer. In this case, the optimal moisture content of wastewater sludge before application should be 30–40%, since in this case it retains water-resistant structural units measuring 0.3–1.5 cm [7, p. 54].

After applying fertilizers, grains (winter barley) or annual forage grasses (shadbar, Sudan grass, a mixture of rye and perk) are sown; tillage of the soil and sowing of crops must be done at the smallest slope, 1–3°. The horizontal (strictly transverse) method of agricultural technology, which is effective in preventive measures to combat gully formation, is excluded, since complete retention of runoff in the bulk surface creates the danger of the development of subsidence-suffusion processes. In the ravine, dangerous territories of the Namangan Adyrs, from organizational and economic measures to the practice of the agro-industrial complex, we introduced a complex of soil systems for conservation agriculture: twice-annual recording and assessment of eroded lands on farms [8, p. 16].

Subsequently, alfalfa or perennial grasses are sown on the reclaimed surface. In dry years and when sowing periods are prolonged, it is recommended to sow the field

with alfalfa and corn. During the period of waxy ripeness, corn is harvested for silage, and alfalfa or grass is left for three years. In the 4th year, reclaimed land, depending on the slope of the area, can be used for row crops, orchards and vineyards.

During the development period (3–4 years), row crops or tree species should not be planted on the planned soil, since irrigation can lead to the development of suffusion phenomena and soil erosion, including secondary ravine formation.

Cutting furrows and irrigating crops during the development of the ravine area, as in the first year of reclamation, are carried out along the smallest slopes. Watering is carried out in small streams (less than 0.1 l/s per furrow) and at a rate of 600–800 m<sup>3</sup>/ha. The length of the cut furrow should not exceed 70–80 m, otherwise the regulation of soil moisture will be difficult.

The specificity and labor intensity of radical reclamation methods for developing ravines requires a number of organizational and economic measures:

1. Creation of strict control (by choosing a responsible person for development blocks) over the progress of agrotechnical measures, the operation of hydraulic structures, the survival rate of forest plantations, the condition and elimination of negative phenomena.

2. Providing differentiated wages for workers involved in the development of ravines and rewarding them based on the final result and, on the contrary, establishing the amount of a fine (in accordance with the Land Law) for mismanagement of land, failure to comply with mandatory measures to protect soils from degradation processes.

The probability of degradation of technogenic soils during radical reclamation of ravines, if the above recommendations are correctly followed, is less than 5% of the total development area. Ignoring at least one of these reclamation methods for developing ravines increases crop and soil losses by up to 50–60% [20, p. 118].

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