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## **Reclamation of disturbed lands in Ukraine environmental aspect**

Existing techniques for the reclamation of disturbed land, developed in the Soviet Union and now require mandatory review, not only from an economic point of view, as well as education environmental.

Areas of reclamation should be determined taking into account such key indicators as the nature of disturbed land and the need for certain land for a specific agricultural landscape (the region).

Disturbed lands are causing great harm to the natural area and not only economic (loss of productive lands SH), as well as environmental, such as disturbed land are the cause of contamination by toxic aerosol substances or hydraulic displacement which is accompanied by a contaminated zone (Kalush Iv. – Frankivsk region of Ukraine). Such open mining bring irreparable environmental effects (Vinos onto the surface of toxic species, disruption of hydrological regime, education craters depression groundwater). Hence the importance of revegetation, which defines a set of culture and technology works aimed at improving the natural environment (landscapes) can not be overemphasized. However, currently neglected revegetation is not given, which was characteristic for the Soviet era (the main „hand” object and then re-cultivation).

The perversity of such a conservation was that return disturbed land in those lands from which they were derived (mostly it was arable land and other s.-g.).

Such an approach could be adopted for reclamation of linear objects (pipelines or storage of topsoil for construction).

When large-scale violations of the Earth's surface (open pit large) needs to rethink the concept of reclamation in preserving the ecological balance in the region.

Years of experience in remediation in the Soviet Union proves that deep pit excavation, which are formed in an open way of getting (Krivoy Rog and the Donets Basin), is almost impossible to return to a state that would use recultivation area of arable land or agricultural land.

Naturally, quarry excavation depth of 20 to 200 meters reveal rocks are different in lithology, and of course for the structure, density and ability to subsidence. So, to return such a career in the state close to natural failed. The actual

technology of mine technical reclamation phase leads to the formation of the microrelief, which was formed from uneven subsidence of the soil.

Measurements of the humus layer recultivation soil (pit manganese ore Dnepropetrovskaya region) showed uneven laying from 0 to 200 cm (Canas OP 2006).

Of course, in such cases it is impossible to transfer reclaimed land in agricultural lands.

Laboratory of Reclamation Institute of Soil Science and Agrochemistry. AN Sokolovsky UAAS in 1976, laid on Morozovska coal mine experience of six edatopov submitted loess, red-brown clay, humus and other ball. Institute of Land UAAS (Department of Ecology, Canas AP) held a series of experiments on these edatopah number of studies on the change in the chemical, physical and biological features of the education of man-made ecosystems under the influence of various phytocenoses (1994–1995).

Studies have shown that all species on the abiotic open pit mine (except supeschanyh) have a certain biogenic capacity and can act as substrates for sustainable ecosystems that are adapted to the environment. Since the content of hydrolytic nitrogen increased during the years of observation twice, and the average annual accumulation of humus were dark – 0,06%. In addition, the composition of microbial biologization coenoses, the number of microarthropods, species composition and number of taxonomic springtails and enzymatic activity. The foregoing makes it possible to talk about the possibility of formation of native flora and bring reclaimed land to grassland further working. This way, if it is impossible to return the disturbed land in tillage, can greatly reduce the cost of land reclamation by building mine technical body dump, where the main component will be potentially fertile rocks, for example – loess. Of course, a very deep career recommend using a recreation (Nikopol manganese ore mine).

Thus, depending on the nature of disturbed land, particularly on the type and parameters of technological systems (career, dumps, tailings), lithology, grain size and chemical composition of the disclosed species, as well as the master, plowed territory, warehouse land of modern landscapes, forest, water objects, should be preferred destinations reclamation are attractive from an environmental point of view economically. This can be traced based on the zoning of Ukraine.

In Polesie, the development of peat, sand, clay pits, reclamation is preferable to a creation of reservoirs and afforestation,

In the forest-steppe, where there is high agricultural development, with a small number eco-stabilization lands leading role in the remediation must be given recultivation. As disclosed by rocks in this area, as a rule potentially fertile, so remediation can have a grassland area or the creation of perennial plantations. Perspective is a recreational area, the creation of environmental niches, ecotones, reservations for the natural flora and fauna.

In the steppe zone of Ukraine, where the main places of mining for metals, which are rich in both closed and open ways. In this landscape have irreversible anthropogenic load, and this leads to ecological imbalances, the more so in the steppes tops in Ukraine Agricultural acreage and plow (respectively 80% and 56%). Therefore, the direction of revegetation in the steppe zone is the environmental and conservation area.

Relatively deep pit excavations (pits) and neighboring foreign dumps used a Reception. Flat top blade Zaluzhany cereal-bean grass mixture, and on the sides of planted forest and shrub plantings. The recess should be used for the creation of the reservoir and places of recreation, which will continue to populate the biota (flora and fauna). Thus, in modern conditions of ecological crisis and improve the environmental landscape of stability of the main direction revegetation should be a conservation principle.

In other words, the main purpose of man-made ecosystems should be made by fastening to the surface exposed rocks protect them from exogenous and the environment from man-made erosion (surface erosion), which soon will provide the conditions for the settlement of native flora and fauna. In the future, such land can be transferred to the environmental use (in forest land or water background).

In addition, virtually unexplored remains problem use of economic mechanisms responsible for failure to land the conditions for the reclamation of disturbed land. On the basis of Article 52 of the Law of Ukraine *On protection of land* from 19.06.2003 № 962-IV are subject to land reclamation, which have undergone changes in topography, the ecological state of soils and parent rock, as well as all of the hydrological regime of mining, geological prospecting, construction and other works.

Article 1 of the Law of Ukraine *On state control and protection of land* № 963-IV dated 19.06.2003 determined that not conduct operations with reclamation of disturbed lands – is the failure of the institutional, technical and biotechnical measures aimed at restoring soil, improve the health and productivity of disturbed land on the basis of the approved land management documentation. In practice, the reclamation of disturbed lands almost done, except for large objects, which leads to damage (loss) from surrounding owners (the owners) and users of land and the territorial community and the state. Abusive land law, which does not meet a set of organizational, technical and biotechnical measures aimed at restoring the topsoil, in accordance with the approved project soil illegally receives income from the use of funds for other purposes, which are estimated to have been received to carry out revegetation.

Thus, the economic concept of damage, which was raised non-performance of the revegetation owner of the land – a loss of profit, which according to article 22 of the Civil Code of Ukraine from 16.11.2003 № 435-IV can not be less than the income that was received by the offender.

The algorithm for determining the amount of damage that has been given the failure of work on land reclamation consists of:

- 1) The definitions of the estimated cost of the institutional, technical and biotechnical measures aimed at restoring soil disturbed land at the date of last inspection on the use and protection of land by the works of its value in the price index of construction works in the mining industry;
- 2) Determine the average annual income of the offender is not carrying out revegetation works by the present value estimates for complex works of land reclamation in the discount rate of the National Bank of Ukraine;
- 3) Determination of the total amount of damage given not to conduct reclamation of land through the works of the average annual income of the offender is not a revegetation for a period of failing to revegetation. Then the general formula will look like this:

$$Sp = \frac{VC \times I \times C}{100} \times T$$

where

Sp – the amount of damage, UAH.;

VC – estimates of the institutional, technical and biotechnical measures to restore the soil cover, UAH.;

I – monthly price indices for construction and installation work for the data of State Statistics Committee of Ukraine;

C – a discount rate of the National Bank of Ukraine at the date of damage, %;

T – the term for revegetation, and months.

### Conclusions

A negative situation that existed in the country on the revegetation requires conceptual foundation composition, content and format of the reclamation. This requires an inventory of damaged land and make a new conceptual additions (changes) to the standards and regulations, as well as the developed state standards, which could solve the problems identified revegetation for specific areas and regions.

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### **Анотація**

Определено онятие рекультивации нарушенных земель. Указаны причины деградации земельного фонда Украины. Освещена законодательная база рекультивации нарушенных земель.

### **Abstract**

Defined principle of revegetation. The causes of degradation of the land Ukraine. The legislative base revegetation.

**Key words:** degradation of land, reclamation of the land.

## **Rekultywacja gruntów uprawnych na Ukrainie w kontekście ochrony środowiska**

### **Streszczenie**

Określenie zasad rekultywacji gruntów. Przyczyny degradacji ziemi na Ukrainie. Legislacyjna baza rekultywacji gruntów.

**Słowa kluczowe:** degradacja gruntów, rekultywacja ziemi,