

SYSTEMATIZATION AND ADMINISTRATION MODALITIES OF DATA CONCERNING ECOLOGICAL IMBALANCE BETWEEN NATURAL AND ANTHROPOLOGICAL SYSTEMS

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Abstract

The paper presents the characterization of ecological imbalance between natural and anthropological systems. The identification and presentation of collection data methods, the systematization and generalization of data of ecological imbalance will contribute to create the Information System (Banc Data for soils) for the quality of soil cover in the Republic of Moldova.

INTRODUCTION

Moldova's ecosystems are grouped in *natural* (forest, steppe, meadow, aquatic and marsh) and anthropogenic or *agriculture* (land occupied by grain crop, vegetables, orchards, vineyards, fallow lands, etc.). Ecological imbalance of these systems can be avoided as anthropogenic factors, as well as natural ones. However, it is necessary to detect ecological imbalance as a result of unfavorable co-report between natural and anthropogenic ecosystems and result of destabilization natural or concrete anthropogenic ecosystem.

The first type of ecological imbalance has arisen with the agriculture appearance. The more are involved in agricultural areas of agricultural land; ecosystems occupy larger areas; ecological imbalance of these ecosystems is more pronounced. So, the concept of ecological imbalance between natural and anthropogenic ecosystems is a relative concept and therefore, it is estimated quite approximately, by the ratio between natural and anthropogenic ecosystems.

MATERIAL AND METHODS

Extension and reckless exploitation of agricultural land have been caused by acceleration of degradation processes; have increased considerably the area of fallow land and temporarily tillage land. In recent years, after implementation of the land reform the balance of fallow soils, pastures and the intensive agricultural use has changed dramatically: with increasing areas of grassland and fallow land decreased perennial plantation surface. The materials collected on the ecological balance in the outcome of general cadastral land records, current records of annual

changes taking place, are generalized and presented in the Land Register, developed and published annually. Materials with present ecological balance are required to implement the land monitoring, environmental monitoring, to assess the environmental situation of each administrative territorial unit.

Collecting information on fallow land areas, eroded, salinized, alkalized soils occupied as forest plantations, swamps, rivers, etc. is made in accordance with contents of recommendation of the Land Cadastre.

To appreciate the ecological imbalance between natural and anthropogenic ecosystems is necessary to consider changes in areas of different ecosystems in a specific period and within each system separate. This makes it possible to highlight and assess the positive and negative trends in the evolution of ecosystems.

RESULTS AND DISCUSSION

The most affected today are past anthropogenic steppe, meadow, marsh and aquatic (pond). Their area decreased by 80% over the past 40 years. A very intentness situation was created between the natural and agricultural ecosystems, and within these systems due to high revaluation of the republic territory. Agricultural terres occupies 2498280 ha (73.8%), including: arable - 1812730 ha (72.6%), plantations - 298780 ha (12%), pastures - 352550 ha (14.1%), fallows - 34210 ha (1.4%).

In total, relatively natural ecosystems (grasslands, forests, wetlands, water) is only 917500 ha or 27.3% of the total area. Grasslands in Moldova are ecosystems with the natural vegetation, however, very anthropogenic transformed. The forests can be considered natural ecosystems. Other forest land holding of 426600 ha or 12.6%, marshes - 21500 ha or 0.6%, water - 87300 ha or 2.6% of the total. The forestation degree of the Moldova's territory is the lowest in Europe, which affects negatively the ecological status of the country.

The cadastral register of land includes quantitative and qualitative information on all land in the communes and rayon's boundaries. Land plan is the graphical representation of the territory, containing data about the location, boundaries and numbers of the sectors of land cadastre and other data. Number of land cadastre sector is an individual number, unique within the country, which is awarded in accordance with the procedure established by law. Module preparation and updating of cadastral plans shall be determined by an instruction, approved by the Agency. Cadastral register of land (cadastral summary sheet) shall be made at the 1 January and contains information on all lands.

Assessments of the land areas *destroyed by ravines, affected by landslides and damaged as a result of human economic activity* is carried out from making land cadastre, and record analog as agricultural land areas. Gullies, landslides, excavation work out of set-aside land with fertile soils, destroying cultural and social objects, houses, roads network.

The first inventory of gullies was carried out in 1911. Adapting the data to geographical division the most affected by ravines were hilly region of Central and South Moldova Plateau. The following inventory conducted in 1965 and 1982 gave the opportunity to make a comparative analysis of desolation formations of deep erosion over 90 years. Materials about the damage and intensity of growth in recent gullies on agricultural land during 90 years have highlighted the changes and spatial dynamics of gullies. If, in 1911 the number of gullies consisted 9543 and surface 14434.2 ha, then in 1965 it increased on average 3.5 times, in the Southern regions more than 10 times.

Annual average growth of gullies varies in large ranges from 0.53 m to 1.48 m on the Nistru Plateau to the South Moldavian Plain. Following the active development of linear erosion the total area of gullies annually increases to 300 ha and total area of land destroyed is 450-500 ha. At present, according to the latest land surveying, affected land area is 12200 ha of ravines, or 0.4 % of total land area.

The documentary evidence of land *areas affected by landslides* after the 1970 was not performed. The data is approximate, which slopes disorder characterized by relatively selective investigation results. After 1970 began to appear the balance of land ravines and land sliding, which meant the annual inter communes cadastral plans.

According to the research since 1990 in Moldova there were 55500 ha of farmland destroyed by active landslides, 350000 ha affected by ancient landslides. Most are affected by landslide processes the forests, which has occurred most important geotectonic movements. Activation of landslides occurs especially during winter-spring; they held high rainfall, with ranges of 3.7 to 9 years. Monitoring of landslides wearing a very specific and methodical he has developed special, which does not into existing monitoring methodology. According to the 2010 land cadastre the area completely destroyed by ravines consist 29800 ha or 0.9%.

The land areas *damaged as a result of human economic activity* is comparatively high. Destruction of soil cover of quarries excavation process is carried out. In Moldova until 1990 career exploration work is performed without re-cultivation of land development projects destroyed. As a result, are now recorded 5000 hectares of land damaged by excavation soil cover, which can be called "industrial deserts". Currently, as a result of human economic activity, is partially or totally destroyed the soil cover an area of 45300 ha or 1.3% of total land area.

Restoration of destroyed land by landslides, ravines, damaged by various activities is necessary a costly improvement. Therefore, surveys in frame of monitoring processes and prevent the development opportunities that may occur are of quite significant. The initial information on the area of ravines, landslides, damaged land can be obtained in the execution of works on pedological or topographical surveys, they are highlighted in the wild, can be measured and drawn on the map. The

collection of data and training on land damaged databases include: initial data, generalization data, statistical process, graphic presentation.

The database on land fallow areas, eroded, alkalized, salinized soils, under forest plantations, swamps, rivers, destroyed by ravines, affected by landslides and damaged as a result of human economic activity is necessary for rational distribution of land within the national economy, creating an optimal balance between agricultural and natural ecosystems, making measures to combat landslides, stopping the growth surface gullies, other land re-cultivation damaged.

Information on the use of soil cover and land surfaces damaged by various negative processes account for the basic documentation for establishing protective measures, improvement and sustainable use of land and increase agricultural production. This information is scientific basis to substantiate the optimal use of land for development projects to improve land and regional planning, to implement the most appropriate technologies to conserve and improve soil fertility. Most information on land use and land areas damaged as a result of natural disasters and economic activity is presented in the Land Register of Moldova. However, this information is incomplete and not always meets the requirements of monitoring of land. These data are difficult to use in the preparation of forecasts for development of ecology negative processes of natural and anthropogenic ecosystems. To create a base of precision data on areas show destroyed land area is necessary to create an Information system of Land Monitoring.

CONCLUSIONS

1. The database on the quality status of the soil cover in the Republic of Moldova give information about the state land, agrarian reform impact, pedogenesis factors and average parameters of the statistics characteristics of the soils, soil erosion and damage caused to the national economy, quality of ameliorative land fund, humus content and soil agrochemical indices.
2. The database will contribute to the right of the citizens to access of information and transparency concerning the quality of the soil cover to promote prevention and control of processes of soil degradation and deterioration, pollution caused by natural phenomena or human activities, for maintaining for the long term agricultural and forestry production capacity of the soil cover, the establishment the quality land monitoring.

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