

## **The actual ecological state of soils in the Republic of Moldova**

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Soils are the main natural heritage of the Republic of Moldova, and different types of agricultural activity are carried out on actually more than 80% of Moldovan territory. More than 60% of agricultural areas are arable lands used for different types of intensive crop cultivation.

About 80% of the soil is of the chernozem types. During the 1980-2000 period, the share of soils not affected by erosion has reduced in the agricultural areas in the northern part of Moldova from 70 to 65 percent, in the central part from 65-70 to 50 percent and in the southern part from 65-70 to 50-65 percent.

Currently, the surface of drained soils is 60 thousand hectares, of irrigated soils - 311 thousand hectares, debugged soils - 546.4 thousand ha and radically transformed soils - 33.4 thousand ha. The annual growth of reconstructed soils through debugging reaches 7 thousand ha. Two hundred and five thousand hectares of soils with high value have been taken out of agricultural production.

Soil erosion is one of the main factors affecting soil fertility in the Republic of Moldova. The eroded lands constitute 1,205 thousand ha or 80 percent of the arable land, while the surface of moderately and strongly eroded soils is 780 thousand ha. The area affected by erosion increases every year by 0.86 percent. The fertility of eroded soils is 40-60 percent lower than in the uneroded areas. Along with fertility decrease, the degradation of cumulic soils from meadows takes place as a result of their calmatation with poor humified material, with environmental pollution, leading to significant economic and ecological damage.

Humus content is a basic index of soil fertility. It determines the most important physical, chemical, biological and agrochemical properties of the soil and is the only storage of biological nitrogen. The average humus content of the soils of the country is 3.16 percent; on a surface of 270 thousand hectares it is under 2 percent. This value is considered to be the minimum admissible level. The humus balance is still negative and there are no indicators of its improvement. The situation has worsened especially after 1990, because the amount of organic nutrients introduced into the soil has decreased 3 times in comparison with the maximal level reached in 1987, while the amount of mineral nutrient has decreased 10 times.

Soil pollution with toxic compounds and production wastes, soil compression and degradation through use of heavy agricultural machinery, irrigation and draining, desertification, soil deterioration during extraction, construction works, etc., are sources of enormous ecological and economic damage.

The main negative factors causing soil degradation are the erosion process, the processes of gullies formation and landslides. In order to protect soil from these negative factors, the elaboration and implementation of projects aimed at the combat of erosion and the introduction of sustainable land use with crop rotation are urgently needed. In addition, such anti-erosion measures as soles application in the direction of level curves, stripes systems of crops with grass belts, the introduction of modern agro-technical measures, and of forestry and hydro-technical amelioration measures must also be applied.

The measures for humus restoration in the soil include the use of the main sources for humus formation, i. e. the roots and stubble residuals, organic nutrients, residual water from cattle breeding, the implementation of soil protective crop rotation in combination with agrochemical methods of crop cultivation. The organic nutrients needs of the country for the stabilization of soil fertility are 8-11 tonnes/hectare on plots with soil rotation. For humus stabilization in the arable soils, it is necessary to produce and to incorporate into the soil no less than 16-18 million tonnes of organic nutrients and compounds obtained from manure, cereals straw, sugar plants defecation, mud, municipal waste waters, muddy sediments of the accumulation lakes etc.

The elaboration and implementation of an ecological soil monitoring system for the evaluation, prognosis and management of soil quality and soil cover is also required. The control over the ameliorative state of soils should be based on the development of prognosis and degradation prevention actions, fertility conservation, introduction of best agricultural practices etc.

The information on biological diversity, soil pollution and degradation, water quality is reflected in reports and scientific publications of state and non-governmental institutions, such as the ecological society "BIOTICA", "Ecostrategii", "Ecos". These organizations developed management plans for wetlands of the Nistru and Prut river basins and, for the purpose of conserving biodiversity in Moldova, river basin management plans. These institutions are also involved in the preparation of a programme aimed at the recovery of soil fertility in Moldova.

The development of a soil fertility recovery programme in Moldova needs strong inter-institutional and international cooperation. An important role in this respect belongs to the review of international experience in this domain, the attraction of best agricultural practices, etc. The creation of educational centers and training programmes for farmers and other target groups involved in soil management will strongly facilitate the process of improvement of the state of soil resources in Moldova.