

Land Consolidation and Anti-Erosion Meliorations, as Tool to Counteract Climate Change in the Water Sphere in Agricultural Areas

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SUMMARY

The main purpose of land consolidation in Poland is to improve the dispersed ownership structure of land in farms and to improve the infrastructure of access roads to agricultural and forest land in rural areas. In many European countries, land consolidation also implements a number of environmental objectives, including – for example in the Federal Republic of Germany, Switzerland or the Netherlands – they help in combating climate change.

Conversion of the land ownership structure creates unique opportunities to implement such measures, including anti-erosion meliorations and measures to increase water retention. The most important protective measures that can be implemented on the scale of one or several villages and part of the physiographic catchment include: adaptation of new fields borders (layout of plots) and the network of agricultural roads to the topography; introduction of protective use (permanent green use, trees, afforestation) in places most exposed to water erosion and in places of concentrated runoff of periodic rainwater; introduction of permanent grassland (buffer strips) along the active edges of ravines; introducing wooded, natural windbreaks, and construction of new retention reservoirs.

The above-mentioned protective measures effectively limit the intensity of erosive soil degradation and the leaching of nutrients from arable land to surface waters, reducing the eutrophication of water reservoirs.

Each drop of rain stopped in the field as a result of land consolidation and coordinated with the anti-erosion melioration increases water retention in the soil and extends its circulation in the environment. This contributes to the reduction of the negative effects of agricultural drought, reduces the yield loss, inhibits the mineralization processes of organic matter in the soil, and, as a

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result, prevents adverse climate changes.

The basis for the development of the anti-erosion meliorations in the land consolidation area is a detailed analysis of the natural and economic conditions, which leads to the identification of areas most exposed to erosion processes and areas requiring regulation of water conditions. In line with the pan-European trend, retention systems covering the riverbed and coastal areas are becoming of particular importance.

The condition for the effective implementation of the anti-erosion melioration system and pro-retention treatments in the process of land consolidation is a positive assessment of their environmental impact carried out by an interdisciplinary team of specialists. Project of anti-erosion meliorations and the so-called small water retention is usually associated with the need to make changes in the structure of land use – preferably within the land consolidation, to which their owners should give their consent. Therefore, as part of land consolidation, an appropriate reserve of land should be planned for these purposes. A very important action that facilitates and accelerates the implementation of the entire consolidation procedure is also the inclusion of participants of land consolidation in the process of preparing the project, that is so-called „active social participation” already at the stage of developing the assumptions for the land consolidation project.

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