
EVALUATION OF THE LAND CONSOLIDATIONS PROCESS IN THE LITAVA BASIN

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Under the project New procedures of optimization of integrated protection area systems in the context of their economic sustainability, analysis of plans of collective equipment was done within the complex process of land consolidation based on data from all branches of the State Land Office in the Litava basin. Every project of land consolidation was vectorised to shapefile format in ArcGIS geographical information system. As the main base map for the vectorization a digital cadastral map was used, which shows plot demarcation of each measure. If a measure has not plot demarcation, there is only small chance of its implementation. These eight shapefiles were created: technical erosion control measures, area measures, reservoirs, terraces, drainage areas, environmental measures (ÚSES), agricultural roads and culverts. After vectorization and analysis of the measures soil loss by erosion by mathematical model Universal Soil Loss Equation (USLE) was evaluated. The USLE is composed of six factors to predict the long-term average annual soil loss (G). The equation includes the rainfall erosivity factor (R), the soil erodibility factor (K), the topographic factors (L and S) and the cropping management factors (C and P). The R and P factors are constant: $R = 40 \text{ MJ}\cdot\text{ha}^{-1}\cdot\text{cm}\cdot\text{h}^{-1}$ and $P = 1.0$; the other factors were determined in GIS software based on maps (Land parcel identification system, DEM, etc).

Based on these calculations, currently about 57% of agricultural land is threatened by erosion. The soil loss by erosion (caused mainly by water) is almost $8 \text{ t}\cdot\text{ha}^{-1}$. This situation is a consequence of the fact that the designed measures were not realized in time, mainly because of the lack of funds. According to the Supreme Audit Office of the Czech Republic only 9% of designed measures were realized.

The process of land consolidations is ever more considered as important tool for landscape water regime, though it mainly solves agriculture and forest land. Water measures – especially in riverbeds – are applied by the state enterprises of the catchment. Therefore cooperation is needed. As the land consolidations are included into the plans of the sub-basins in the Czech Republic, the cooperation will probably be better.