



Spatial Modelling of Agro-Ecological Condition of Soils in Steppe Zone of Ukraine

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Abstract: Soil degradation is the main problem of the decrease of their fertility. This problem in Ukraine occurs due to a number of problems. Active use of lands has led to the fact that about 93% of the territory of Ukraine is used by various economic activities. Plowing is the main problem between others which occupies over then 53% of the territory of the country, which is much higher than allowed in agricultural countries of the European Union, where the maximum use of land for growing crops is only 34%. Another important factor is the afforestation of Ukraine, the area under the forests and shelterbelts is currently only 17%, which means that there is an environmental imbalance, for example, this indicator in the European Union averages between 31-37%. The Southern steppe zone is considered to be the most plowed part of the country. Here the area of plowing is almost 90% of the territory. The problem of plowing is strengthened by non-professional use of land, which is expressed in excessive depletion due to improper crop rotations and lack of black fallow of the fields which leads to a decrease of the humus layer. The difference between the humus content in virgin chernozems and those which are under agricultural use is very significant. The virgin soils have in the fertile layer about 10% of humus, but in steppe soils this indicator is about 4%. Excessive land use, according to some scientists, also contributes to an increase in CO₂ in the air, as soils are a natural storehouse of carbon. As a consequence of this the expansion of the steppe zone in Ukraine is occurs. Therefore, modern situation in agricultural land use requires constant monitoring of the agro-ecological condition of soils to identify changes in their fertile qualities, which will allow timely decision making to take the necessary measures to ensure proper soil condition. And spatial modelling of agro-ecological properties is an instrument of GIS-technologies which helps to present all collected data in the form of maps, which simplifies the perception of information.

Keywords: Agro-ecological condition, Spatial modelling, Heterogeneity, GIS-technologies
