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Mapping soil erosion factors and potential erosion risk of the National Park „Central Balkan”

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Abstract

Soil erosion is widely recognized environmental problem. The report aims at presenting the main results from assessment and mapping of the factors of sheet water erosion and the potential erosion risk on the territory of National Park "Central Balkan". For this purpose, the Universal Soil Loss Equation (USLE) was used for predicting soil loss from erosion. The influence of topography (LS-factor) and soil erodibility (K-factor) was assessed using small-scale topographic and soil maps. Rainfall erosivity (R-factor) was calculated from data of rainfalls with amounts exceeding 9.5 mm from 14 hydro-meteorological stations. The values of the erosion factors (R, K and LS) and the potential risk were presented for the watershed areas. Using the methods of GIS, maps were plotted presenting the area distribution among the classes of the soil erosion factors and the potential risk in the respective zones. The results can be used for making accurate decisions for soil conservation and sustainable land management in the park.

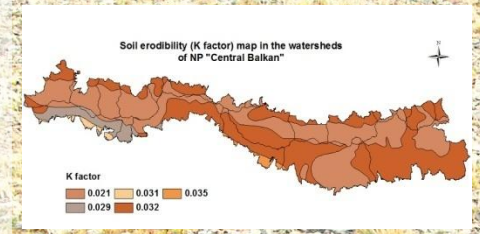
Methodology

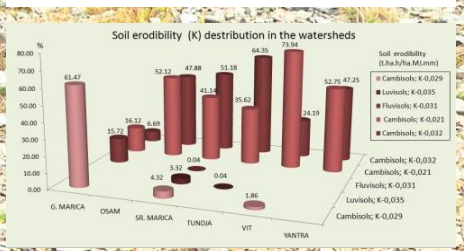
The influence of topography (LS-factor) and soil erodibility (K-factor) was assessed using small-scale topographic and soil maps. Rainfall erosivity (R-factor) was calculated from data of rainfalls with amounts exceeding 9.5 mm from 14 hydro-meteorological stations.

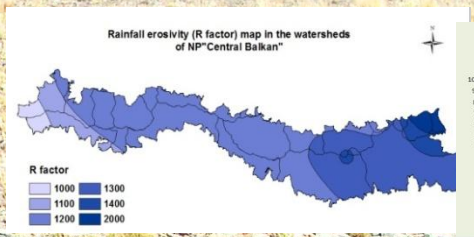
$$A = R\,K\,LS$$

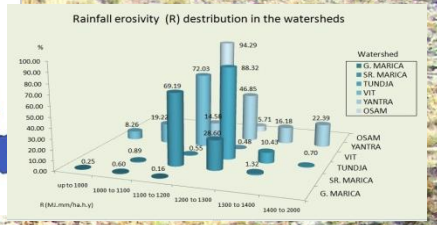
A-potential average annual soil loss, t / ha;
R- factor of rainfall erosivity, MJ mm/ha y;
K-soil erodibility factor, t ha h / MJ ha mm;
LS - topographic factor.

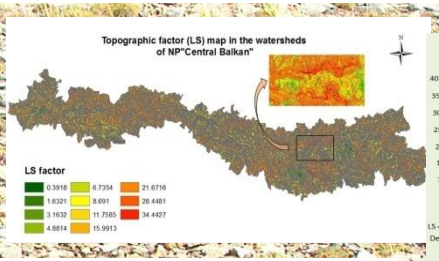
Results

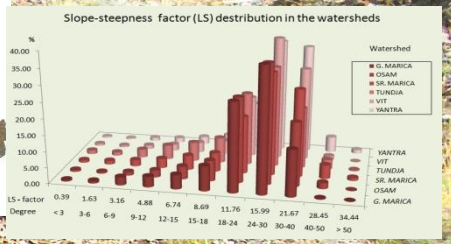


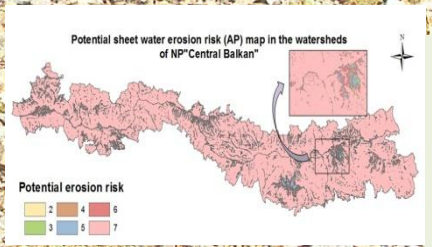


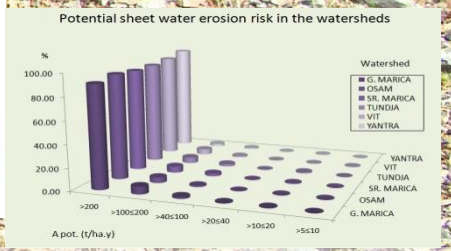












Conclusions

Over 70 % of the territory of the 4 watersheds fall rainfalls with high and very high erosivity – 1000 to 2000 MJ.mm/ha.h.y.

Cambisols cover over 98 % of the all area and are with middle erodibility – 0.021 to 0.032 t.ha.h/ha.MJ.mm.

The slopes of the mountain with 12 to 40 degrees and LS values from 6.74 to 21.67 cover more than 90 % of the 5 watersheds' territory. That is a precondition for high erosion potential of the runoff.

The high factors values define high potential erosion risk (A > 200 t/ha.y) over 90 % of the park territory.

The assessment of the factors and potential erosion risk shows that serious efforts are required and funds for the conservation on the soil and the sustainable management of National Park "Central Balkan".