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ORIGINAL ARTICLE

# Geospatial comparison of four models to predict soil erodibility in a semi-arid region of Central India

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**Abstract** The soil erodibility factor of RUSLE is one of the important indicators of land degradation. It can be measured either directly under natural or simulated rainfall condition or indirectly estimated by empirical models. A geospatial variation of this factor is essential for prioritization of reclamation measures. However, geospatial upscaling of soil erodibility factor is very uncertain because of its dynamic nature and dependent on the parameters used in the model. This paper studies the geospatial comparison of the effectiveness of four different models to predict the soil erodibility factor by means of the independent role of each model parameter. 669 soil samples were collected from different land uses of Central India on grid basis and analyzed for physicochemical properties. The soil erodibility factor was estimated using four different models. Geostatistical analysis was performed on the point erodibility data of each model to obtain the spatial pattern. Analysis of variance showed that soil properties and erodibility factor varied significantly with various land uses. Croplands showed higher susceptibility to erosion than woodlands and grasslands. The erodibility equation that used particle size with soil organic matter showed better agreement with the variation of land use than the equation used only particle size. Therefore, the models that dynamically integrate soil intrinsic properties with land use can successfully be used for geospatial upscaling of soil erodibility factor.

**Keywords** Geospatial analysis · GIS · Land use · Soil erodibility factor

## Introduction

Soil erosion is a natural process to maintain the balance between different ecosystem functionaries. However, accelerated-soil-erosion-led-land-degradation, due to non-