Spatial distribution pattern and risk assessment of degradation degree of sloping cropland in the typical black soil region

Shouhao Zhang[1], Lei Sun[1], Shouhao Zhang[1], Yong Niu[2], Zhaofei Fan[3], Zhang Hongda[1], Xia Liu[1], and Shouhao Zhang[4]

[1]Nanjing Forestry University
[2]Shandong Agricultural University
[3]Auburn University
[4]Institute of Soil Science Chinese Academy of Sciences

October 5, 2023

Abstract

Clearing the status of sloping cropland degradation in typical black soil region is the basis for restoring and reconstructing degraded black soil. To date, the spatial distribution pattern of degree of soil degradation is lacking. In this paper, we predicted the spatial distribution of degree of soil degradation based on the soil degradation index (SDI). We compared the accuracy of Ordinary Kriging (OK) and Sequential Gaussian Simulation (SGS) with different simulation times. SGS was also used to evaluate the degradation risk of sloping cropland in typical black soil region of Northeast China. The results showed that: SDI ranged from 0.013 to 0.864, with a mean value of 0.445. The realization with 200 times by SGS was the best, with an increasing pattern of SDI from north to south in the study area. Mildly degraded soil, moderate degraded soil, severe degraded soil, and extremely severe degraded soil accounted for 35.3%, 52.4%, 12.1%, and 0.2% of total sloping cropland, respectively. The potential degradation risk and high-risk areas were about 53.4% and 23.1% of the total sloping cropland, respectively. The result of risk assessment could serve for making decisions by relevant departments.

Hosted file

`manuscript-Shouhao Zhang.docx` available at https://authorea.com/users/671442/articles/670976-spatial-distribution-pattern-and-risk-assessment-of-degradation-degree-of-sloping-cropland-in-the-typical-black-soil-region