



Quantitative Assessment the Soil Productivity of Black Soil Resources and the Influence by Soil Erosion in Northeast China

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As the significant grain production base in China, the soil productivity in Northeast has always been attracted our attention. However, the ecological function was destroyed by the soil erosion with the irrational development activities and management. The national food security has been threatened by continued drain of soil nutrient and decline of soil productivity. Black soil resource is the basic natural resource in black soil region of Northeast China. Therefore, it is necessary to study the impact of soil erosion on black soil resource and its productivity from the perspective of protecting the black soil resource and sustainable productivity. The thickness of black soil which is closely related to soil productivity is worthy of attention. Based on the field investigation and laboratory analysis, physicochemical properties of soil and thickness of black soil layer of 150 soil profiles were obtained to assess soil productivity by soil productivity index model in Song-nen black soil region. Significant differences were found in thickness of black soil layer and soil productivity between typical black soil sub-region and chernozem sub-region. The thickness of black soil in Song-nen black soil region changed from 2.4 to 242cm with the average of 69.7cm. Productivity Index (PI) in Song-nen black soil region varied from 0.1 to 1 with the average of 0.49. The thickness of the black soil layer and PI in north were higher than south. It showed a decreasing trend from northeast to southwest. By analyzing the black soil resource warning, the south, north and the middle of the north part of the typical black soil sub-region has the higher risk. Effective soil and water conservation and ecological restoration needed in these region. The productivity in topsoil has the highest level and also the most vulnerable to erosion. The emphasis should be on protecting the black soil, especially the surface soil, from damage and erosion in protecting black soil resource and maintaining the soil productivity.