

Changes in Ecosystem Service Values on the Loess Plateau in Northern Shaanxi Province, China

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Abstract

The Loess Plateau in northern Shaanxi Province of China covers Yulin, Yan'an, and Tongchuan cities mainly. The kind of physiognomy is complicated and various, including the transitional region of the sand and wind, the hilly-gully fragile region, the pimple mound region from North to South. Large-scale land reclamation projects that are severely affecting these ecosystems have been implemented. In this paper, we reported an investigation to the changes in land use and ecosystem services on the Loess Plateau in northern Shaanxi Province from 1978 to 2000. We used three LANDSAT TM and/or ETM data sets to estimate the changes in the size of five land-cover/land-use categories, and we also used previously published value coefficients to estimate the changes in the value of ecosystem services delivered by each land category. Finally, we ranked the contribution of various ecosystem functions to the overall value of the ecosystem services. We have estimated that the annual value of the ecosystem services is 56.95 billion RMB yuan in the Loess Plateau in northern Shaanxi Province in 2000. In the region, from 1978 to 2000, the economic value of the fixing carbon was higher, the economic value of water conservation was the lowest, but the economic value of the NPP, fixing carbon, and supplying oxygen accounted for above ninety percent of the total value, obviously the vegetation created the biggest ecosystem service value. We can conclude that future land-use policy formulation should give precedence to the conservation of these ecosystems over uncontrolled reclamation, and that further land reclamation should be based on rigorous environmental impact analyses.

Key words

landuse; ecosystem services; the value; ecosystem functions; the Loess Plateau; northern Shaanxi Province