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Estimates of loss in ecosystem service values of Songnen plain from 1980 to 2000

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Ecosystem services are premises for human beings to exist and develop in the world, and it is of importance to study effects of land use change on ecosystem functions. Songnen plain, located in Northeast China, is one of the national key bases for agricultural production. Because there were remarkable variations in land use in recent years, it can supply specific foundation for protection and restoration of regional eco-environment to explore changes in its value s of ecosystem services. This study aims to qualify long-term changes in land use of Songnen plain from 1980 to 2000, and to explore the impact of land use change on ecosystem services. With 2-period land use data using RS and GIS, this paper analyzed changes in land use and in ecosystem service values using the ecosystem service value coefficient s (VC) put forward by Costanza et al. Results showed that from 1980 to 2000, area of rangeland, water area and wetlands and area of cropland decreased, but urban area and unused land increased. Due to cropland's comparatively low VC and comparatively high VC of wetlands and water area, increment in cultivated land could not offset the total decremen t in regional ecosystem service values because of the decrease in area of wetlands and water area. Meanwhile, city sp rawl has also led to loss of ecological values. Total ecosystem service values of the study area reduced dramatical l y, from $34,926.10 \times 10^6 \$$ to $31,744.54 \times 10^6 \$$ in the period 1980-2000. This represents a 9.11% net decline in annual val ue of ecosystem services in the study area.

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关键词: ecological values; land use change; ecosystem service; Songnen plain