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Quantifying Response of Ecosystem to Land Use/Cover Changes in Yulin Prefecture based on Ecological Services Evaluation

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The technologies of remote sensing(RS),global position system(GPS),geographic information system(GIS) and various ecological and economic analysis methods were employed in this paper,and based on remote sensing images,DEM and other data,and spatial and temporal distribution of ecological service values in Yulin Prefecture were calculated.In order to quantitatively evaluate the response of ecosystems to land use/cover changes,the factors affecting regional total ecosystems service were analyzed and separated,and response index and response degree of ecosystems to land use/cover changes were presented.The results revealed that 1) The total values of ecosystems services in Yulin Prefecture were 237.58 billion Yuan in 1987,173.43 billion Yuan in 1999 and 283.69 billion Yuan in 2002,and varied with the spatial variation.Generally,the value of ecological services per unit land in Northern Six Counties is less than that in Southern Six Counties,while the total value of ecosystems services in Northern Six Counties is more than that in Southern Six Counties.During the study period,the proportions of the services values of farmland was decreasing continuously and that of forests and grasslands was increasing respectively,both in Northern Six Counties and Southern Six Counties.The sharpest increase in Northern Six County happened in forestland,and in Southern-Six-County grasslands;2) Land use/cover changes and climate fluctuation are mainly responsible for the changes of regional total values of ecosystems service annually.Thus,only when the influence of climate fluctuation eliminated,the response of ecosystems to land use/cover changes can be evaluated more objectively.This was exactly indicated by the results of response indexes of ecosystems to land use/cover changes.For most of regions at different spatial scales in Yulin Prefecture,the contribution rate of land use/cover changes to the variation of total ecosystems services values is less than that of climate fluctuation during the two study stages,which indicates that the limitation of climate to the selection of vegetation types should be considered when ecological construction in arid area with large precipitation variation;3) Various response degrees of ecosystems to land use/cover changes in different regions and stages can be compared.Response degree of ecosystems to land use/cover changes during the period of 1987~1999 is 65.66 Yuan per hectare per year,and 81.64 Yuan per hectare per year during the period of 1999~2002,and the latter is higher than the former.Besides Yuyang District,Shenmu County and Mizhi County,in other regions at different spatial scales in Yulin Prefecture,the response degree of ecosystems to land use/cover changes during the latter period was higher than that during the former period.The change of total ecosystems services values resulted by land use/cover changing in Northern Six Counties during the former period was greater than that in Southern Six Counties,while it was reverse during the latter period.

【Key Words】 : **Yulin Prefecture Services values of ecosystem Response index of ecosystem to land use/cover changes Response degree of ecosystems to land use/cover changes**

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