

Optimization of Territorial Spatial Functional Partitioning in Coal Resource-based Cities Based on Ecosystem Service Clusters - The Case of Gujiao City in Shanxi Province

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Abstract : The coordinated development of "ecology-production-life" in cities has been highly concerned by the country, and the transformation development and sustainable development of resource-based cities have become a hot research topic at present. As an important part of China's resource-based cities, coal resource-based cities have the characteristics of large number and wide distribution. However, due to the adjustment of national energy structure and the gradual exhaustion of urban coal resources, the development vitality of coal resource-based cities is gradually reduced. In many studies, the deterioration of ecological environment in coal resource-based cities has become the main problem restricting their urban transformation and sustainable development due to the "emphasis on economy and neglect of ecology". Since the 18th National Congress of the Communist Party of China (CPC), the Central Government has been deepening territorial space planning and development. On the premise of optimizing territorial space development pattern, it has completed the demarcation of ecological protection red lines, carried out ecological zoning and ecosystem evaluation, which have become an important basis and scientific guarantee for ecological modernization and ecological civilization construction. Grasp the regional multiple ecosystem services is the precondition of the ecosystem management, and the relationship between the multiple ecosystem services study, ecosystem services cluster can identify the interactions between multiple ecosystem services, and on the basis of the characteristics of the clusters on regional ecological function zoning, to better Social-Ecological system management. Based on this cognition, this study optimizes the spatial function zoning of Gujiao, a coal resource-based city, in order to provide a new theoretical basis for its sustainable development. This study is based on the detailed analysis of characteristics and utilization of Gujiao city land space, using SOFM neural networks to identify local ecosystem service clusters, according to the cluster scope and function of ecological function zoning of space partition balance and coordination between different ecosystem services strength, establish a relationship between clusters and land use, and adjust the functions of territorial space within each zone. Then, according to the characteristics of coal resources city and national spatial function zoning characteristics, as the driving factors of land change, by cellular automata simulation program, such as simulation under different restoration strategy situation of urban future development trend, and provides relevant theories and technical methods for the "third-line" demarcations of Gujiao's territorial space planning, optimizes territorial space functions, and puts forward targeted strategies for the promotion of regional ecosystem services, providing theoretical support for the improvement of human well-being and sustainable development of resource-based cities.

Keywords : coal resource-based city, territorial spatial planning, ecosystem service cluster, gmop model, geosos-FLUS model, functional zoning optimization and upgrading

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