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## 基于正态云模型的湖北省土地资源生态安全评价

### Normal cloud model based evaluation of land resources ecological security in Hubei province

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中文摘要:

针对综合指数法与模糊综合法无法同时兼顾评价指标模糊性与随机性的问题, 该研究将正态云模型引入区域土地资源生态安全评价。基于正态云模型, 以湖北省为例, 对区域土地资源生态安全状况进行了定量测度。研究结果表明: 2000—2010年间, 湖北省土地资源生态安全状态从敏感级上升到良好级, 土地资源生态安全综合值从2.9397上升为3.6033, 区域土地资源生态安全整体水平有变好的趋势, 但目前仍有部分指标处于恶劣、危险或敏感级, 其单因子指标值<2.5, 有待于进一步提高与改善; 正态云模型使土地资源生态安全的定量评价兼顾随机性和模糊性, 该研究可以为区域土地资源可持续发展提供一定借鉴与参考。

英文摘要:

Abstract: Land resource is very scarce natural resources. Finiteness and scarcity of global land resources have become a common concern to human sustainable development. With the accelerating of industrialization and urbanization, man-land relationship is going into the crux of the conflict. If land resources are damaged seriously, it will also affect regional security and the sustainable development. Evaluation of land resource ecological security is an important content of regional sustainable development measures. The previous evaluation methods that were comprehensive index method and fuzzy synthesis cannot describe the fuzziness and randomness of evaluation indexes at the same time. In view of that problem, normal cloud model was introduced into regional land resources ecological security evaluation. Cloud model was the making of Li Deyi academicians based on traditional fuzzy mathematics and probability statistics. The rule of land resources ecological security evaluation was constructed combining the basic theory of cloud model and the process of ecological impact evaluation for land consolidation. By translating the uncertain factor conditions into quantitative values with the uncertain illation based on normal cloud model, the evaluation factor scores and comprehensive scores of Hubei Province land resources ecological security were computed. Study results indicated that : (1) Hubei Province land resources ecological safety status enhanced from the sensitive level to a moderate level, it increased from 2.9397 to 3.6033. The general trend of regional land resources ecological security was elevated from 2000 to 2010. Index value less than 2.5 indicated a severe, dangerous or sensitive level; (2) The normal cloud model was a mathematical representation of fuzziness and randomness. The transformation from qualitative concepts to quantitative expressions were realized when the fuzziness and randomness were integrated together. The method preserved the randomness and fuzziness in evaluation. Evaluation method of regional land resources ecological security based on the normal cloud model was an objective and scientific comprehensive assessment method. The study could provide a reference for the sustainable development of regional land resources.

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