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陕北延河流域基于GLP模型的流域水土资源综合配置

Integrated allocation of water and land resources based on GLP model in Yanhe watershed

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中文关键词: [模型](#) [土壤](#) [试验](#) [延河流域](#) [GLP模型](#) [面向生态](#) [水土资源综合配置](#)

英文关键词: [models](#) [soils](#) [experiment](#) [yanhe watershed](#) [gray linear programming model](#) [ecology-oriented](#) [water-land resource integrated allocation](#)

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中文摘要:

该文基于延河流域近50 a的水、土、气等因素的动态资料,在测评流域生态环境需水和社会经济用水的基础上,运用灰色线性规划(GLP)方法,构建水资源—土地资源耦合系统模型,探讨多目标情景下“面向生态的”水土资源综合配置方案。结果表明,随着供水能力的提高,流域林果产业前景广阔,城市化进程将不断加快。2020—2030年,预计流域在低配方案下有林地、灌丛林、园地的面积将分别由1 201.51、412.87 km²调整为1 434.67和589.24 km²,建设用地面积将由346.73 km²调整为575.38 km²。

英文摘要:

Many researches on optimal allocation of water or land resource have been done at present, but few attention was paid to the combination of these two factors based on ecosystem. In this research, based on continuous 30-year weather condition report data, 10-year soil water content data and nearly 50-year hydrographic data in Yanhe watershed, and with remote sensing and GIS spatial analysis, the minimum, moderate and maximum ecological water requirement for land resource system were investigated. Additionally, with GLP (Gray Linear Programming) model, the allocation modes of water and land resources were put forward based on ecosystem which aimed at satisfying the ecological water requirement for land resource system and maximizing the ecosystem service value. The purpose of all above efforts was to offer a method for using water and land resources in effect, protecting ecosystem as well as developing social economy. By using GLP model, the constraints equations were established for satisfying ecological water requirement and the objective functions for realizing the coordinate and sustainable development in ecology and economic. The results showed that with the increase of water resources supply, the fruit industry was developing well, and the urbanization process was accelerating. It can be expected that from 2010 to 2030, the forests, shrubs and garden land will increase from 1 264.49, 1 201.51, 412.87 km² to 1 434.67, 589.24 km², and the construction land will increase from 346.73 to 575.38 km², when satisfying the minimal ecological water requirement.

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