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论文

基于多主体行为决策的城市居住用地利用效用情景分析

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摘要:

构建包含智能主体和环境主体的城市居住空间演化情景模型,旨在探讨土地利用主体的行为决策与居住空间演化形态和土地利用效用之间的关系。调整城市政府主体的土地利用政策设定紧凑型、松散型和适度型三种居住空间演化情景类型,通过综合分析城市居民、住宅开发商和城市政府三类微观主体的相互作用求取每种情景下住宅用地开发的综合优先级函数。在VC和ArcGIS的实验环境下,以武汉市洪山和武昌区为实验区模拟了三种规定情景下实验区在1998年至2008年期间的居住空间演化情况,并与实际演化情况进行扩张形态和土地利用社会效用的概略对比,对比结果表明,多主体模型能有效比对不同主体空间决策情景下土地利用的效用,在表现土地利用主体的意愿方面更有优势,更能反映城市土地利用结构演变的内在规律。

关键词: 城市居住空间演化 情景模型 多主体 GIS 空间决策

Scenario Analysis of Urban Residential Land Use Utility Based on Multi-agents' Spatial Decision

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Abstract:

This paper builds a multi-agents model to study the impact of the agents' spatial decisions to the urban residential space evolution form and land use efficiency in the process of urban extension which contains one environment agent and three micro intelligent land use agents: residents, property developers and urban government. By the method of PEAS, the model induces the interactions among the three intelligent agents on the basis of the recognitions of their behavior characteristics and concludes that urban residential lands are developed in a priority sequence which is decided by the three intelligent agents' spatial decisions and interactions. First, residents will choose favorable residential locations according to the law of consumption utility maximization. Then, property developers will choose these locations which can bring the maximized benefits. Residents and property developers' spatial decisions represent market mechanism which indicates the self organization of urban residential space in a degree. Furthermore, urban government agents will adjust the residential land developing priority sequence based on the comprehensive consideration of the social and ecological land use utility. So by adjusting the land use and environmental protection policies of urban government agent the model sets three scenarios which respectively represent the compact, relaxed and controlled modes of urban residential space extension and gets the residential developing priority function in every scenario. By the function, the model can get the preview of the evolution of residential space in every set scenario and provide land use planning policy guidance for urban government in advance. Taking Wuchang and Hongshan districts in Wuhan as the experimental areas, the paper compares the land use structure and land use efficiency in the process of the residential space evolution from 1998 to 2008 among the three scenarios and the actual situation respectively. The comparison indicates that land new development holds a lager proportion in the evolution process of the experimental residential space from 1998 to 2008, that is to say the land redevelopment level of old urban in experimental districts is not enough. In fact the government of Wuhan city had focused on residential new development of the suburban fringe areas before 2004, but the emphasis has been transferred to the old city transformation and land redevelopment after 2004, the point verifies the validity of the model to a certain degree. Compared with the model's simulating results under different scenarios, the factual residential space evolution always has intersections with the three simulating results respectively, which means urban government may adjust its land use policy, natural environmental protection policy and so on under the influence of macroscopic environment in different

periods. This is just one of the characteristics of Chinese real estate market. Excepting this, from the model simulating results, urban residents have attached increasing importance to the rights and interests of themselves, at the same time because of the action of market economic mechanism, the property developer also paid more attention to the favorite choices of urban residents; and the urban government gave more attention to the public willingness and the growth of resident welfare as well.

Keywords: urban residential space evolution scenario model multi-agents GIS spatial decision

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