

Spatial multicriteria decision analysis tools applied to urban consolidation in low density areas

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Abstract

The urbanization process in Portugal has led to an extensive and discontinuous growth of urban areas. This phenomenon is present in both metropolitan areas, with prevalence of an extensive urban development model, as in low density areas where urban growth follows is more discontinuous and scattered. This urban growth model has major impacts in the increase of urban infrastructures costs, energy inefficiency, CO₂ emissions associated with the mobility as in the decrease of productive and natural resource areas. To reverse this trend, urban planners need to develop methods for selecting new urban suitable areas, that integrate new objectives and different criteria that promote urban consolidation. These objectives are commonly conflicting and the complexity and spatial nature associated with this processes justifies the use of GIS-multicriteria decision analysis methods (GIS-MCDA). This paper presents a method that uses a GIS-MCDA system and integrates economic, social and environmental objectives for defining new urban areas in the city of Vila Real. The results demonstrate that the consideration of new criteria and objectives derive more consolidated solutions for urban expansion.

Keywords: urban consolidation, geographic information systems, multicriteria decision analysis, urban planning tools, low density areas.

