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Research Article

## An open source GIS-based Planning Support System: Application to the land use plan of La Troncal, Ecuador

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### Abstract

Planning Support Systems (PSS) comprise a wide variety of geo-technological tools related to GIS and spatial modeling aimed at addressing land planning processes. This article describes the OpenRules system, a PSS based on a previous system called RULES. Among OpenRules new features are its architecture, based exclusively on free and open source software, and its applicability to all land use types, including rural and urban uses. In addition, OpenRules incorporates an unlimited number of land evaluation factors and a new objective in land use spatial allocation. OpenRules has been programmed in Java and implemented as a module of the free GIS software gvSIG, with full integration between the GIS and the decision support tools. Decision support tools include multicriteria evaluation, multiobjective linear programming and heuristic techniques, which support three basic stages of land use planning processes, namely land suitability evaluation, land use area optimization and land use spatial allocation. The application of OpenRules to the region of La Troncal, Ecuador, demonstrates its capability to generate alternative and coherent solutions through a scientific and justified procedure at low cost in terms of time and resources.

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