ABSTRACT

The past decade has seen extraordinary growth in demand for decision support tools. This demand is due to various reasons: development of remote sensing technology has opened up access to inexpensive, reliable, repetitive data of the earth's resources; human cognition has limitations to handle this voluminous data. Unfortunately, traditional Geographic Information Systems have not kept pace with these advancements. A large number of techniques like Operations Research methods, Multi-Objective Decision-Making methods, Multi-Criteria Decision Making methods like Analytical Hierarchy Process, Compromise Programming, Fuzzy logic techniques etc. have to be included in these packages. The present research work explores the utilization of these methods for addressing land use planning and land use change dynamics problems. The main research objective is to improve the modeling capability of GIS with techniques from Operations Research, Fuzzy logic techniques, and Cellular automata methods and to view them not only as a framework for spatial dynamic modeling, but as a paradigm for thinking about a complex spatial-temporal phenomena and as an experimental laboratory for testing ideas. This research work provides a framework with various decision-making techniques, thereby enhancing the existing GIS functionality and making it a more analytical tool.