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An Approach For Addressing The Complexities Of Urban Sprawl By Developing A Spatial Planning Support System Using Agent Based Models With Reference To Thiruvananthapuram District

Urban sprawl is the spatial expansion of cities into its periphery. Studies reveal that more responsive spatial planning techniques require an in-depth understanding of the emerging patterns of spatial change apart from assessing the change trends in the variables that contribute to urban growth and sprawl in cities. Pioneer researchers had brought out different computational models to address these complex systems. One such tool for simulation is Agent Based Models, used for understanding the dynamics and characteristics of urban growth. Such models can be used to devise a localized and focused spatial planning support system, which helps in controlled or guided growth achieving sustainable development. The study addresses the issue of urban sprawl in Thiruvananthapuram, Kerala based on a hypothesis 'regional transportation networks attract new developments beyond the urban core and cause urban sprawl and the spatial characteristics of such uncontrolled developments are unique in smaller cities'. Analysis of land cover-land use changes, assessment of sprawl patterns using Shannon's entropy, primary household survey using stratified random sampling are involved to assess specific characteristics of the current development trends that contribute to urban sprawl. The outcome clearly suggests that if the current unplanned spatial growth trends, are continued more open land including economically fragile zones will be engulfed. Thus, effective distribution of development densities is essential, and the pattern of development taking place along transportation corridors has to be efficiently monitored. An ideal Spatial Planning Support System (SPSS), developed on an agent-based modelling environment, helps in managing, planning, organizing, coordinating, monitoring and evaluating the complex dynamics of urban sprawl. Using the catalysts and characteristics of sprawl identified in the study area a prototype for a Spatial Planning Support System is devised using Agent Based Models. The prototype developed is unique and newly attempted for Thiruvananthapuram region.

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