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Relevance Of Agent Based Models For Addressing The Complexity Of Urban Sprawl

Urban Sprawl is the uncontrolled and uncoordinated outgrowth of towns and cities. Sprawl is a dynamic and complex phenomenon. The research is a study to understand the complexity of urban sprawl, various models used to address sprawl and relevance of Agent Based Models (ABM) in addressing the complexity of Urban Sprawl. The study is based on secondary data and literature review. Cases studies establishing the character of sprawl are studied, leading to the need to address complexity of sprawl using models. The five models which are in complexity science are detailed, providing with its indicators, purpose, output, and drawbacks. From which it is understood that Agent based models, which are advanced in the field has the capability to cater the inabilities of the other four models such us Cellular Automata, Systems dynamics, Artificial Neural Networks and Fractal based models. Further a detailed chapter on ABM is included, giving the advantages and applications of the model. The study is continued by taking two cases showing the application of Agent based models to address sprawl. The study gives an idea on the inputs required, indicators, programming language used, and output generated. From the case studies, a comprehensive list of indicators for sprawl is formed leading to a framework for addressing the complexity of urban sprawl. The framework thus developed, is a spatial planning and decision-making support system. Through the spatial projection city's growth pattern can be simulated. The Spatial Planning and decision-making support system will be open for changes, any catalyst can be added further at any time and their pros and cons can be checked. This would allow the concerned authorities of urban areas to regularly plan review and monitor the direction in which urban growth heads towards achieving sustainable development. Thus, the research in overall is a study to know the framework evolved will help in making efficient master plans for cities by understanding the growth pattern and sprawl direction