Urban growth prediction model, using the INEGI database. Application in the State of Nuevo Leon, Mexico.

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Abstract

The purpose of this study is to establish a framework to identify a prediction model in urban growth for the simulation of the dynamics in the logistics network for an organization in the field of housing construction in the State of Nuevo Leon, Mexico. This study particularly focuses on a regression modeling algorithm due to the availability of data, since these are usually an important constraint factor. Historical baseline input data on urban sprawl land use interpreted from 1970 to 2010 were used to predict 2020 land use based on urban sprawl growth. Subsequently, the results are compared with the land use in the years 2020 presented in the INEGI (National Institute of Statistics and Geography) to identify the accuracy of the predictive model that allows determining urban growth. The research methodology includes three main stages: (1) preparation of historical data on the number of dwelling houses (1970, 2010), (2) data simulation using a regression model in the Python software environment, and (3) visualization data in Tableau. A coincidence relationship of 83% was found on the increase in the urban sprawl, the final modeling was completed until the year 2040, the results show a distribution of urban growth with a high percentage of increase in the metropolitan area; from 7.7% in 2030 to 21.1% in 2040. This increase occurs at the expense of land use for agricultural, industrial and natural purposes. The study recommends to decision makers the geographical orientation for the search of land reserves for the planning of future housing development works in the State.

Keywords

Prediction of urban growth, regression model, INEGI, State of Nuevo Leon.