Analyzing and Forecasting of Land Prices in Colombo District

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Land prices are an important indicator of the economic and social development of a country. However, forecasting land prices is a challenging task due to the complexity of the factors that influence them. This study investigates the application of machine learning techniques along with the geospatial analysis for forecasting land prices around 50 main cities within the Colombo district of Sri Lanka. Utilizing the data submitted by the customers as advertisements to sell their land in "Lanka Property Web" website in the period of 2018 to 2023. Spatial network analysis was done using shape files obtained from the Survey Department of Sri Lanka. Those shape files allowed creation of new variables based on the nearest actual distances from specific locations such as hospital, national school, railway station, main road and bus stop to selected land plots. Comprehensive model fitting was conducted to evaluate the performance of various Machine Learning algorithms, including Linear Regression, Gradient Boosting, XGBoosting, Random Forest and Artificial Neural Network with two hidden layers and an output layer consist with 'relu' output function. XG boosting with learning rate of '0.1' and number of estimators of '50', emerged as the most accurate model with an accuracy of 62.23%, significantly exceeding the accuracy of linear regression (8.29%), GradientBoosting (60.01%), Random Forest (58.54%) and Artificial Neural Network (48.01%). The results showed that the distance from 'Colombo 1' to other cities affects the current land prices. When the distance from Colombo 1 increases, average land price per perch and the standard deviation of per perch price decreases gradually. Colombo 1-15 areas were the highest demanding cities in Colombo District. These results suggest to improve infrastructure and connectivity in outer regions to add value to the land in those areas. In conclusion, people who are willing to sell their land can use the web app developed from the research above, to have an idea about the selling price of their land.

Keywords: Land Price Forecasting, Machine Learning, Spatial Analysis, Sri Lanka, Colombo District, Real Estate

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