

Linking Socioeconomic and Geographical Model to Analyze Land Use Changes in the Jakarta - Bandung Mega Urban Regions

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Continuing rapid urbanization has led to escalating socio-economic and physical interaction between two adjacent megacities in Indonesia namely Jakarta and Bandung megacity. Physically, enhancing the connection over time has formed urban corridors that stimulate rapid land use changes as well as the expansion of urban-rural land use mixture in the vast area between the two big cities. As land use composition is essential to achieve urban sustainability, modelling land use changes is required as a tool for decision makers to assess the sustainability of different urban form. Nowadays, land use changes model has been rapidly developed owing to increasing computation capacity which is capable of incorporating previous trend of land use changes (e.g. Markov Chain), spatial correlation (e.g. Cellular Automata), and related driving factors (e.g. Logistic Regression or Neural Network) within the model. However, this model is too focused on geographical aspect, while lacking to consider socio-economic factors which spatially might have distinctive properties such as spatial heterogeneity, spatial network, and spatial multiplier effect. This paper aims to combine socioeconomic and geographical factors to analyze complex and dynamic land use systems as found in Jakarta-Bandung Megacity corridors. Land Change Modeler (LCM) from Idrisi Terset software as a combination of Neural Network and CA-Markov model would be enhanced by incorporating socioeconomic aspects analyzed by GWR (Geographical Weighted Regression) for detecting spatial heterogeneity, gravity model for analyzing spatial network, and spatial autocorrelation model (SAM) for defining spatial multiplier effect. This model would be compared to the results of LCM as a single approach. A new model is suggested as an enhanced approach to understand multiple factors that influence land use changes in Jakarta-Bandung megacity corridors, thus more comprehensive policies can be formulated.

Keywords: Urbanization, Socioeconomic model, Geographical Model, Land Use Changes, Jakarta-Bandung Mega Urban Regions