

Using Geographically Weighted – Binary Logistic Regression to Analyze Land Cover Change Phenomenon (Case Study: North West Java Development Region)

Qonita R. Muzdalifah (1), Albertus Deliar (1), Riantini Virtriana (1)

¹ Remote Sensing and Geographic Information Science Research Group, Bandung Institute of
Technology (ITB), No. 10 Jalan Ganesha, 40132, Indonesia

Email: qonitarahmamz@gmail.com; albert@gd.itb.ac.id;

riantini@gd.itb.ac.id

Abstract: Land is one of the important resources that can be used to supply the needs of human life. Uncontrolled land utilization will cause land cover change phenomenon. Land cover change phenomenon can be analyzed by using a model. To get an accurate result, the selection of models in the analysis of land cover change must be based on the characteristics of land cover change phenomenon itself. Land cover change is a binary phenomenon and strongly related to the local characteristics of region. A model that can be used in the analysis of binary phenomena is Binary Logistic Regression (BLR) model. However, the application of BLR model has a disadvantage. BLR model is one of the global models which assumes that the analyzed phenomenon has homogeneous characteristics for the entire study area. This does not correspond to the characteristic of land cover change phenomenon. Therefore, we need another local model that is able to show local characteristic variations of land cover change. Geographically Weighted Regression (GWR) model is one of the local spatial regression techniques that can be used to analyze phenomena that have spatially heterogeneous characteristics. The application of GWR model for binary phenomena (dependent variable) such as land cover change is called Geographically Weighted – Binary Logistic Regression (GW-BLR) model. This research aims to analyze land cover change phenomenon in the North West Java Development Region using GW-BLR and compares the result to BLR model.

The results of this research indicate that the analysis of land cover change in the North West Java Development Region using GW-BLR model has a higher level of accuracy compared to BLR model. The modeling results of land cover change using GW-BLR model have the overall accuracy value of 91.10% and using BLR model has the overall accuracy value of 84.09%. Therefore, it can be concluded that land cover change phenomenon in North West Java Development Region can be analyzed more accurately by using the GW-BLR model.

Keywords: Land cover change, geographically weighted–binary logistic regression, binary logistic regression.