

Spatial Predictive Modeling of Agricultural Land Sustainability using Geographic Information System

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Indonesia is one of countries with a big population growth. The population growth impact the food needs and land necessity for settlement. When the population increased, the needs of land for settlement is rising and it may diminish the agricultural land. To ensure food security, each districts are obligated to maintain the extent of agricultural land in their region so they can comply their own food need. For example Kulonprogo District as a research area, with the population growth reaches 0,47 percent per years, requires at least 5029 hectares as stated in the district regulation no. 1 of 2013. It requires a way to predict the extent and distribution of agricultural land to establish a policy that protect the sustainability of agricultural land.

The aim of this research is map the agricultural land that would be exist for five years later (2018) based on the spatial predictive modeling of landuse change and trend of land necessity for settlement. Multitemporal remote sensing data from 2003 until 2009 used as an input in GIS modeling. This model consider physiographic aspects such as topography, accessibility and land use to distribute spatially the number of agricultural land required.

Based on the model, the result of this research is the built up area ascension due to the settlement needs does not trigger the shortage of agricultural land in Kulonprogo District. At least there are still over than 1000 hectares of land that can be preserved for agriculture until 2018. In this case, GIS plays a role as a prediction tool of sustainable agricultural land management and the scenario resulted can used as a reference for land preservation policy.

Keywords: spatial predictive modeling, agricultural land, Geographic Information System