Land Use Change Detection using Remote Sensing and GIS Technology in Siak District, Riau Province, Indonesia

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Siak District is an enlargement from some parts of Bengkalis District that was done in 1999. In last 10 years, Siak District as a new district has been developing their region in order to support the people activities, and also try to be at the same level as other districts. The development that has been conducting may alter land uses which involve land conversion from a type of use to other uses. Along with the increasing of population, the need of land for settlement and crop plantation may change several types of land uses, such as forest land and agriculture land.

The Remote Sensing and Geographic Information System (GIS) technology are used in order to detect the land use changes in Siak District during 2002 ? 2008 which is conducted in three main activities: (1) field data collection, (2) land use classification, and (3) land use change detection. The simple random sampling and secondary data collecting are used in order to collect the history of the land use directly from the field. The combination of feature extraction technique and K-nearest neighborhood is applied to carry out the supervised classification on Landsat images (2002, 2005, and 2008). The transition and probability matrices of land use changes can be produced by comparing and calculating the transformations among the classified images. The result of this research hopefully may facilitate the understanding of the process of land use changes, and furthermore can be used as basic indices for modeling land use change in Siak District.

Keywords: land use change detection, feature extraction, k-nearest neighborhood, remote sensing and GIS