GEOGRAPHIC OBJECT BASED IMAGE ANALYSIS (GEOBIA) FOR VEGETATION TYPES IDENTIFICATION IN AGRICULTURAL AREA

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Abstract: The development of high-spatial resolution remote sensing images allows many possibilities of detailed vegetation studies. In rural areas, the identification of agricultural vegetation types often hindered by the small size of the farm plots and the complexity of the objects in the farm. A relatively new classification technique namely Geographic Object Based Image Analysis (GEOBIA) was developed to address complex image interpretation which considered the spectral, spatial and contextual aspects of objects being studied. This study aims to (1) identify the types of agricultural vegetation type in part of Dieng Plateau, Central Java, Indonesia using a combination of WorldView-2 image and GEOBIA, and (2) assess the accuracy of the results through area-based accuracy assessment technique. A multi-resolution segmentation was firstly conducted to delineate the agricultural object candidates. Then a visual image interpretation combined with field visit was carried out to identify some key recognitions of agricultural vegetation types using a pan-sharpened WorldView-2 image (0.5 m pixel size). These key object recognitions were then applied to the rule-based classification in GEOBIA considering the spectral, geometry, and textural parameters. The classification result accuracy was tested using an area-based accuracy assessment by comparing the result with visually interpreted map of agricultural vegetation types as reference. The results show that GEOBIA was able classify agricultural vegetation types such as potatoes, carrot, cabbages, etc., with an overall accuracy obtained was 69,10%. This study shows the potential application of GEOBIA in discriminating agricultural vegetation types despite the low accuracy obtained. Future work will focus on incorporating contextual information to increase the accuracy of the classification.

Keywords: GEOBIA, WorldView-2, rule-based classification, agricultural vegetation.