

OBJECT BASED APPROACHES FOR IDENTIFICATION OF LAND USE/LAND COVER CHANGES USING MULTITEMPORAL LANDSAT IMAGERY IN BANDUNG, WEST JAVA, INDONESIA

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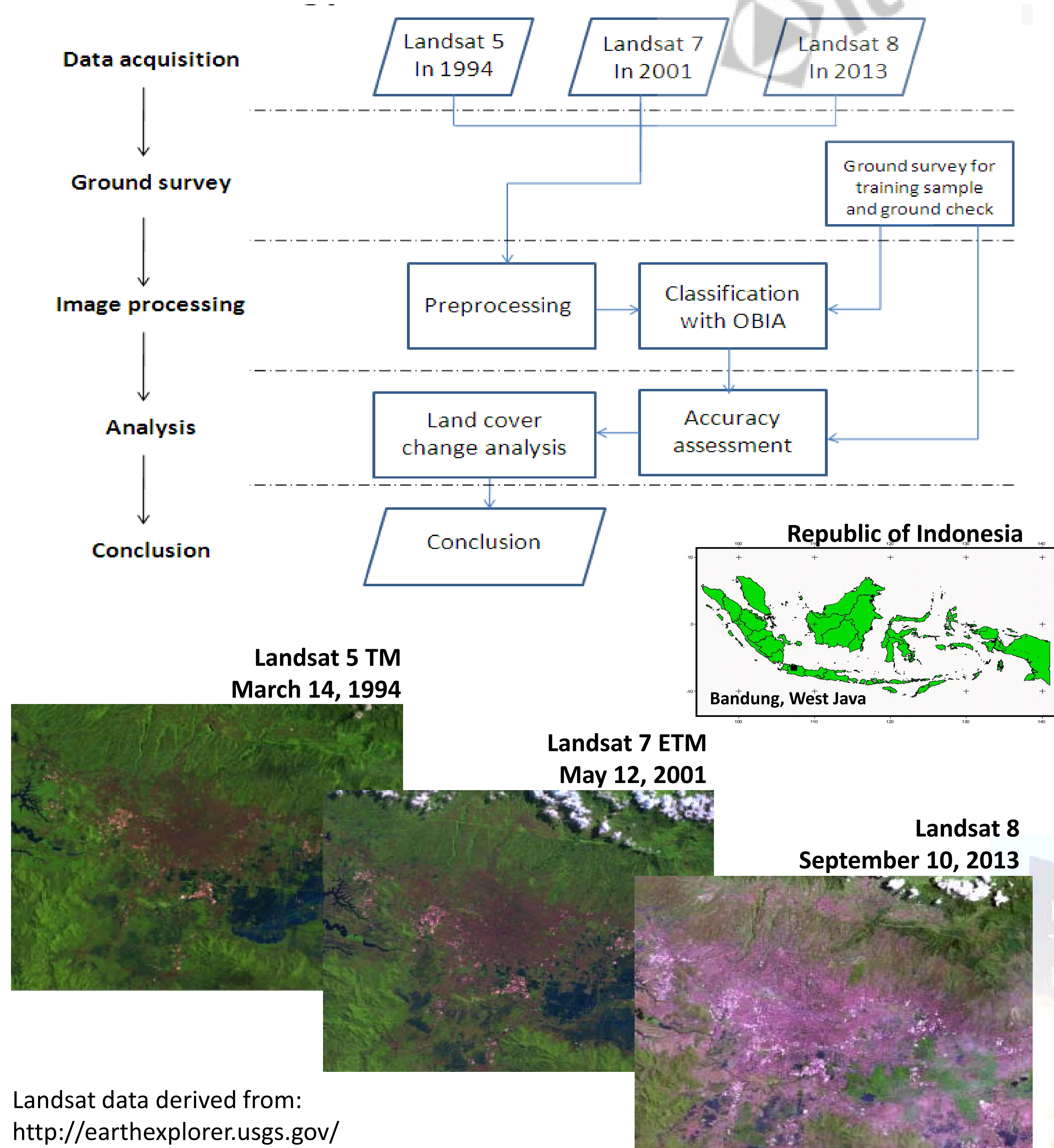
Abstract : Bandung is one of major cities in Indonesia with high economic and population growth. Economic and population growth can effect land use/land cover change. Information of land use/land cover changes is very important for planning and disaster mitigation. Land use/land cover changes can be detected by satellite imagery. Object Based Image Analysis (OBIA) is a promising method for image classification. This study aims to apply OBIA approach for the identification of land use/land cover changes in Bandung, West Java – Indonesia in time period 1994 to 2013 by using multitemporal Landsat satellite data. The methodology consists of satellite data acquisition, pre-processing, field survey, classification of land use/land cover using OBIA, ground check, and analysis. The research has resulted land use/land cover changes information in Bandung, West Java, Indonesia with moderate accuracy. The results indicated that some land cover types of artificial surfaces (such as urban and industrial areas) and bare areas have increased.

Keywords : Object based image analysis , Landsat multitemporal data, land use/land cover changes.

Introduction

Object Based Image Analysis (OBIA) is a technique used to analyze digital imagery. It was developed relatively recently compared to traditional pixel-based image analysis (Burnett and Blaschke 2003). OBIA is based on information from a set of similar pixels called objects or image objects, which are groups of pixels that are similar to one another based on a measure of spectral properties (i.e., color), size, shape, and texture, as well as context from a neighborhood surrounding the pixels. In this study, OBIA will be used to classify multitemporal Landsat satellite images in Bandung Basin. Information of those land cover changes will be very useful for supporting the policy of sustainable environmental management.

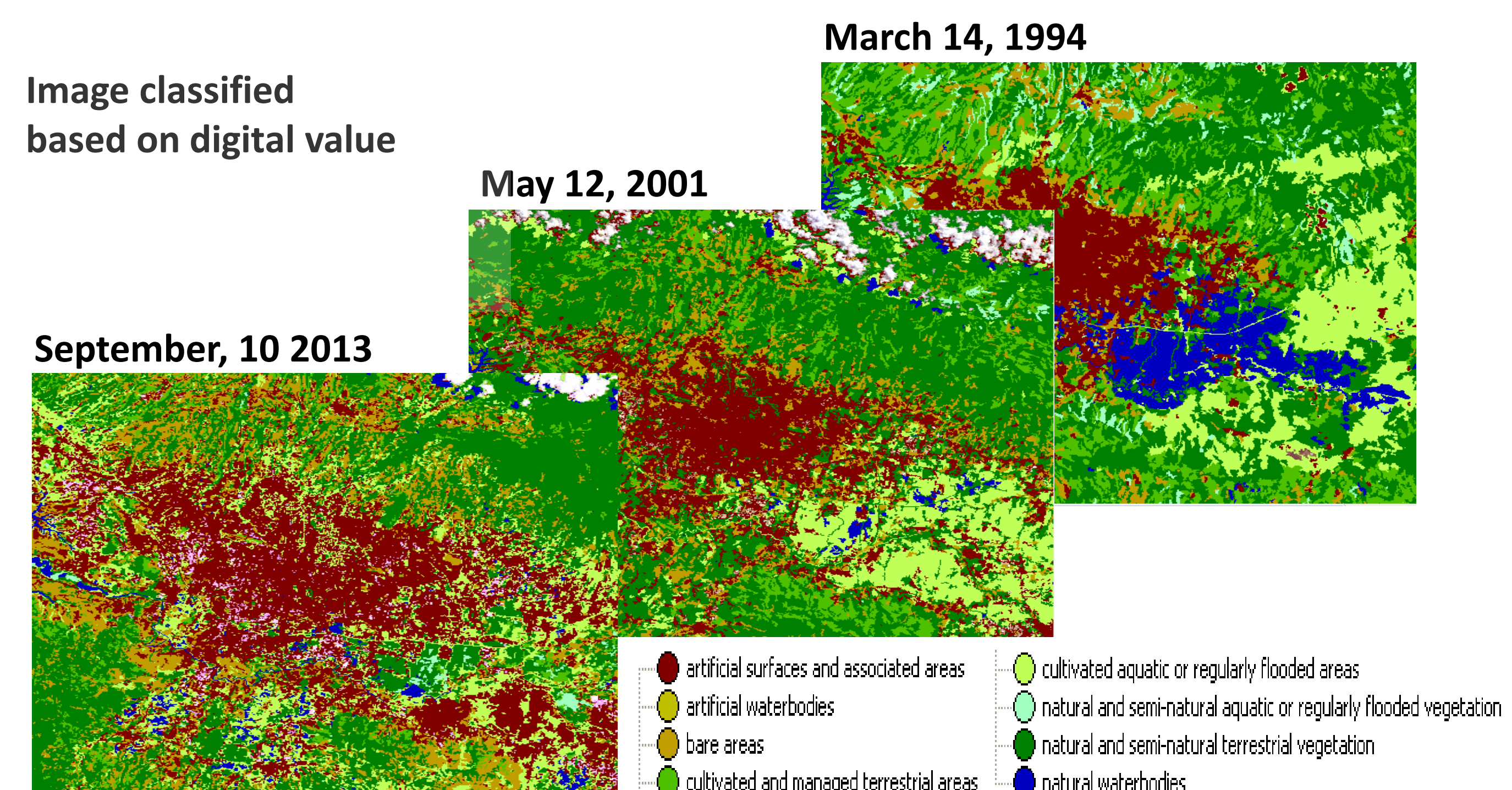
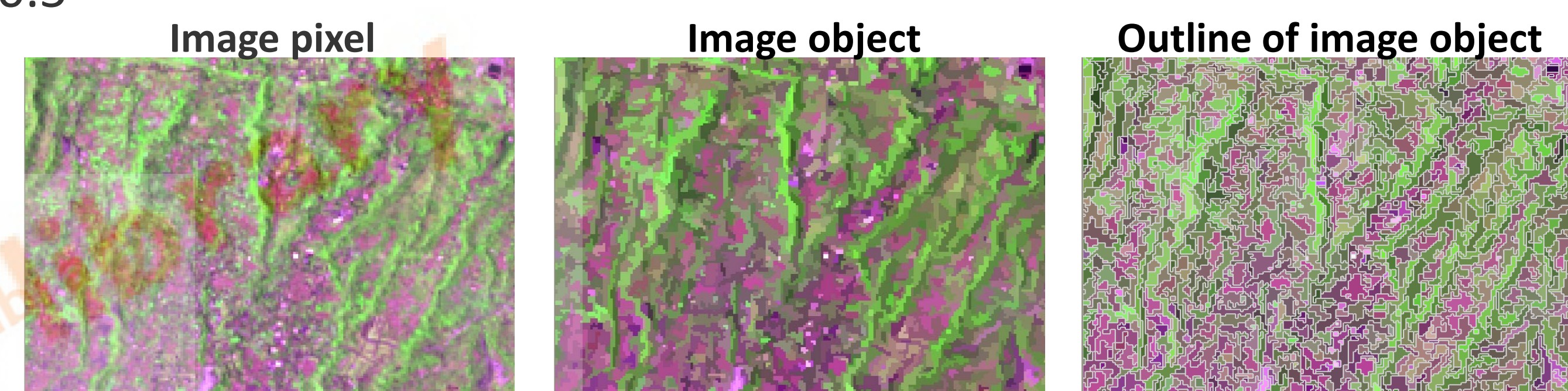
Method and material



Landsat data derived from:
<http://earthexplorer.usgs.gov/>

Result

Pre-processing for radiometric correction was based on Huang (2001) and for topographic correction based on Riano (2003). Segmentation in scale of parameter 10, composition of homogeneity criterion is color = 0.9, shape factor = 0.1, compactness = 0.5 and smoothness = 0.5



Conclusion and further research

This study has obtained information about land cover changes in Bandung Basin. The results indicated that land cover types of artificial surfaces (such as urban and industrial areas) and bare areas have increased. Accuracy assessment results gave only moderate accuracy. Missed training samples in multitemporal data could be the potential factors that affect the accuracy of image classification in this study. Further research will use OBIA with several rules for classification of land cover to improve the accuracy and to analyse the impact of land cover changes to environmental disaster in Bandung Basin area.

Acknowledgment

We would like to thank USGS for making available the Landsat Data. This work has been funded by Institut Teknologi Nasional (Itenas) Bandung, Indonesia.

Main reference

Kalluri S. N. V., Ja' Ja' J., Bader D. A., Zhang Z., Townshend J. R. G., and Fallah-Adl H. 2000, High performance computing algorithms for land cover dynamics using remote sensing data, *International Journal of Remote Sensing*, **21:6-7**, 1513–1536.