Contextual Classification Applied To Change Detection In A Suburb

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Abstract

Land cover practice in the suburb of Hanoi is characterized by the fragmented pattern in spatial distribution. The economic development together with the demographic increase, create rapid changes in agricultural land of Hanoi. Under this circumstance, the multi-temporal approach traditionally used in spectral image classification is facing to a big confusion due to the limited discrimination capacity of optical images even we increase their spatial resolution.

This paper presents a comparative case study in which two methods of classification are used: maximum likelihood and contextual ones. These two algorithms are applied for the same data set of two Landsat images: TM and +ETM of December 27th 1993 and January 13th 2003 respectively. A small area situated in the Southern District of Hanoi has been chosen for this purpose. This site is characterized by rapid changes in land cover and by a diversity of land use types which lead to the unacceptable confusion, especially between the urbanized area and humid soil, in traditional classification using maximum likelihood method. The contextual classification carried out with the help of E-Cognition software gives a better result. In this study site, the segmented from image objects are placed in their contexts which are characterized by such features as their size, their form, their compactness etc. according to the discrimination capacity of each listed features. The biggest changes are liked to the paddy fields replaced by the vegetables and by the new building blocks. Other important change is related to the transformation of the small houses into larger ones with a higher density.

The case study results show that the contextual classification would be used as a promising tool for image processing applied to such fragmented and complex suburban land cover context as it is in Hanoi.