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ANALYSIS OF CHANGES IN THE METROPOLITAN AREA OF BRASOV, ROMANIA, USING LANDSAT MULTITEMPORAL SATELLITE IMAGES

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Abstract

An important objective of local authorities is to obtain quickly precise information concerning the land cover changes and to monitor them. This type of information can be gathered with the help of multitemporal satellite images Landsat Thematic Mapper (TM) and Landsat Thematic Mapper Plus (ETM+). This paper identifies and analyzes the land cover changes in the metropolitan area of Brasov, Romania, using Landsat 5 TM images acquired in 1987 and 2009 and Landsat 7 ETM+ acquired in 2000. The images were classified in seven land cover classes by supervised classification method. The accuracies obtained were of 88.57% for 1987, 90.48% for 2000 and 92.38% for 2009. Land cover change maps were generated by post-classification change detection methods for the periods 1987-2000, 2000-2009 and 1987-2009. The change map accuracy for 1987-2009 was assessed, after it was transformed in a change/no-change map, as being 77.60% with Kappa statistic of 54.84%. The thematic images highlighted the fact that in the period 1987-2009, two major changes concerning land cover took place: the decrease by 53.09% of the cropland in favor of urban areas, uncultivated areas and pastures and the increase of urban areas by 45.71%. The analysis of the urban growth on the basis of satellite images Landsat 5 TM and 7 ETM+ in correlation with the demographic growth in the period 1987-2009 revealed that the annual urban growth rate was of 2.08%, while the annual demographic growth was of -0.53%.

Key words: change detection, Landsat, metropolitan area

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