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Land Use and Land Cover Changes in Arid Region: The Case New Urbanized Zone, Northeast Cairo, Egypt

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ABSTRACT

The spatial characteristics of land cover are useful for understanding the various impacts of human activity on the overall ecological conditions of the urban environment. The multi-temporal Landsat images (TM) between the years of 1990 and 2003 were used together with the Geographic Information System (GIS) techniques to evaluate the environmental changes in the area around Gabal El Hamza and the surrounding urban expansion in the new urban cities at the northeast side of the Greater Cairo by using the post classification change detection technique and field investigation. Five major units were determined including: urban, cultivated land, Holocene sand dunes, Oligocene basalt and Miocene–Pleistocene sediments. The cultivated cover changed from 89.6 to 150.4 km² for the years of 1990 and 2003 respectively. The urban area increased from 49.5 to 120.9 km² with a great value of change reached 71.3 km². The basaltic exposures changed from 3 to 3.75 km². The sandy cover decreased from 68.9 to 60.1 km² and the exposures of the rock units changed from 904.8 to 780.8 km² with removing 124 km² in 13 years. The total accuracy of the Landsat-derived land cover data was 95 and 92% for the years 1990 and 2003 respectively. Landsat TM thermal infrared data indicated that the surface temperature was strongly affected by the land cover changes.

KEYWORDS

Land Cover Changes, Accuracy Assessment, TM Images, Land Surface Temperature, Egypt

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