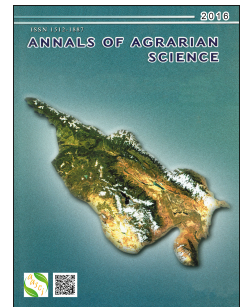


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F Assessment of Landuse/Landcover (LULC) change of Tbilisi and surrounding area using Remote Sensing (RS) and GIS

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Abstract

In this study, LULC changes are investigated by using Remote Sensing (RS) and Geographic Information Systems (GIS) in Tbilisi, capital of Georgia. A number of factors contribute to the changes in the LULC. Rapid urbanization has led to dramatic changes in land use practice. The expansion of the population of Tbilisi peaked in the 1970s. This resulted in a high demand for living space and an active phase of urbanization of the outskirts of Tbilisi begun, ending with the collapse of most social systems after the dissolution of the USSR in 1991. A new wave of urbanization hit the city in the beginning of the 2000s. This process was accelerated by the incorporation of nearby recreational zones into the city's administrative area in 2007. In this study, digital image processing was used in the analysis and assessment of the land use changes since 1987 throughout 2016. After the classification of the Landsat 5 and Landsat 8 OLI it became apparent that there were 5 different classes of LULCs. The change in the size of the surface area of each class during the previous 29 years was also determined. Sharp rise in the built-up area was discovered after the change detection. Built-up area increased 13.9% in 2016 compare with 1987. Therefore, available data on LULC changes can provide critical input to decision-making of environmental management and planning the future.

Keywords: Remote sensing, GIS, Land use and Land cover (LULC), Change detection, Image classification, Tbilisi

1. Introduction

To understand recent changes in the Earth system, the scientific community needs quantitative, spatially-explicit data on how land cover has been changed by human use over the last 300 years and how it will be changed in the next 50-100 years [1]. These changes in terrestrial ecosystems are closely linked with the issue of the sustainability of socio-economic development since they affect essential parts of our natural capital such as climate, soils, vegetation, water resources and biodiversity [2, 3]. Much study in recent years point out that, land cover is changing rapidly in many parts of the world, particularly in areas with high population density. Traditionally land use and land cover (LULC) is a core information layer for a variety of scientific activities and administrative tasks (e.g. hydrological modeling, climate models, land use planning). In the last two decades, land use land cover (LULC) change became an additional irreplaceable observation feature not only within Europe but on a global context [3]. As

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