



A GIS-based Analysis of Land Use and Land Cover Change Detection in Kancheepuram District: A case study in Tamilnadu, India

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Abstract

With increasing scale of anthropogenic change and impacts on environment, it has become extremely important to have water resources. The world's freshwater ecosystems are vital components of the global biosphere, yet are vulnerable to climate and other human-induced changes. There is increasing recognition that lakes play an important role in global biogeochemical cycling and provide ecosystem balance. In the past two decades Nathapettai Lake, Ponneri Lake and Vadakkupattu Lakes in Kancheepuram District were contaminated due to Industrialization and Urbanization. These lakes are prone to flooding during the rainy season and dry up during the summer. The water quality is poor and it is not suitable for domestic and industrial uses. Therefore, it is essential to study the water quality of water. Land-use/cover is largely determined by the ecological conditions, altitudes, geological structure and slope along with technological, socio-economic and institutional set-up, which influence the land-use pattern. Hence, there is an urgent need to study the land use land cover of the present study area using Remote Sensing and GIS techniques, and water quality analysis coupled with field validation. Two decadal time series remote sensing data have been used to derive the land use and land cover changes analysis. Topographical Map is used to find out the area of the lakes in the past. DEM data is used for analyzing morphometric study of the catchment, and Google Earth images of recent decades are employed to map the changes of land use and land cover of the lakes. The derived results revealed that human settlements and industries have encroached the lake area and the quality of water is deteriorating each year. The turbidity of these lakes is increasing year by year. The present study clearly indicated that Nathapettai and Vadakkupattu Lakes are more polluted than Ponneri Lake. The Ponneri Lake is an agriculture influenced lake and the other two were influenced by industries and urban population. The water qualities of Nathapettai and Vadakkupattu lakes were drastically changed due to the release of industrial effluents and it is essential to take necessary action to conserve these lakes.

Keywords: Urbanization, Encroachment, Turbidity, Water Quality, Water Capacity